COMPUTER PROGRAM FOR CALCULATING VENEER RECOVERY VOLUME AND VALUE

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JULY 1967

FOREWORD

THE COMPUTER PROGRAM DESCRIBED IN THIS PAPER WAS DEVELOPED BY THE STATION'S TIMBER QUALITY RESEARCH PROJECT AS PART OF THE FOREST PRODUCTS RESEARCH PROGRAM OF THE FOREST SERVICE DEVOTED TO DEVELOPING LOG AND TREE QUALITY STANDARDS.

PARTICULAR CREDIT IS DUE FLOYD JOHNSON AND DOROTHY MARTIN OF THE STATION'S BIOMETRIC STAFF AND JOHN HENLEY OF THE TIMBER QUALITY RESEARCH PROJECT FOR ASSISTANCE IN DEVELOPING THIS PROGRAM.

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========== INTRODUCTION ==========

WHEN A VENEER RECOVERY STUDY IS COMPLETED AND VENEER RECOVERY VOLUMES ARE TABULATED, THE RESEARCHER IS PRESENTED WITH THE TIME CONSUMING AND OFTEN TEDIOUS TASK OF COMPILING THE DATA INTO USABLE TABLES AND FIGURES. THIS COMPUTER PROGRAM WILL ACCOMPLISH THIS IN LESS TIME AND WITH GREATER ACCURACY THAN HAND CALCULATIONS.

VENEER RECOVERY STUDIES ARE BEING MADE BY THE PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION'S TIMBER QUALITY RESEARCH PROJECT TO DEVELOP BETTER LOG AND TREE GRADES AND CURRENT RECOVERY VALUES.

MILL STUDY TECHNIQUES HAVE BEEN DEVELOPED FOR OBTAINING ACCURATE GRADE RECOVERY INFORMATION BY INDIVIDUAL PEELER BLOCKS AND UNDER MILL PRODUCTION CONDITIONS.

COMPUTER PROGRAMS HAVE, LIKEWISE, BEEN DEVELOPED TO CALCULATE VENEER RECOVERY VALUES AND VOLUMES. THIS MANUSCRIPT IS ONE OF SEVERAL THAT ARE AVAILABLE FOR USE ON RECOVERY STUDIES.(*1)(*2)(*3)(*4)(*5)

(*1) NEWPORT, CARL A., AND LEACH, JOE. A METHOD FOR THE APPLICATION OF CHANGE IN GRADE FACTORS TO INDIVIDUAL LOGS. U.S. FOREST SERV. PACIFIC SOUTHWEST FOREST AND RANGE EXP. STA. TECH. PAP. 44, 10 PP. 1959.

(*2) MILLER, ROBERT M., AND ROOF, SHARON D. AUTOMATIC PROCESSING OF TIMBER APPRAISAL CRUISES. U.S. FOREST SERV. PACIFIC SOUTHWEST FOREST AND RANGE EXP. STA. TECH. PAP. 74, 25 PP. 1962.

(*3) FRAZIER, GEORGE D., AND CARNEY, RONALD B. COMPUTING AVERAGE LOG VALUES FOR TIMBER APPRAISALS USING IBM 650 OR UNIVAC SOLID STATISTICAL 80 COMPUTERS. U.S. FOREST SERV. PACIFIC SOUTHWEST FOREST AND RANGE EXP. STA. TECH. PAP. 54, 16 PP. 1961.

(*4) MARTIN, DOROTHY E., AND JOHNSON, FLOYD A. ELECTRONIC COMPUTER PROGRAM 650-16--LUMBER TALLY VOLUME BY LUMBER ITEMS BY LOGS FOR LUMBER RECOVERY STUDIES. 1961. (UNPUBLISHED STATISTICAL-TECHNIQUES REPORT NO. 4-61, ON FILE AT PACIFIC NORTHWEST FOREST AND RANGE EXP. STA., PORTLAND, OREG.)

(*5) HENLEY, JOHN W., AND HOOPES, JILL M. AN ELECTRONIC COMPUTER PROGRAM FOR CALCULATING SAW LOG LUMBER RECOVERY AND VALUE. U.S. FOREST SERV. PACIFIC NORTHWEST FOREST AND RANGE EXP. STA., 47 PP., ILLUS. 1967.

THE PROGRAMS DESCRIBED HERE ARE SPECIFIC IN MEETING THE NEEDS OF THE TIMBER QUALITY RESEARCH PROJECT AND THE VENEER TALLY METHODS USED IN THESE STUDIES. HOWEVER, THE PROGRAMS ARE GENERAL ENOUGH TO PROVIDE SEVERAL VARIATIONS IN DATA CALCULATIONS THAT OTHER PROGRAM USERS MAY NEED.

THERE ARE TWO BASIC PROGRAMS TO CONSIDER, VENEER RECOVERY PROGRAM ONE (VR-1) AND VENEER RECOVERY PROGRAM TWO (VR-2). THEY SHOULD BE CONSIDERED COMPANION PROGRAMS SINCE VR-2 REQUIRES THAT A VR-1 RUN BE MADE FIRST.

THE TABLES AND CARDS PRODUCED IN A RUN OF VR-1 PROVIDE THE USER WITH INFORMATION TO EDIT RECOVERY DATA. WHEN EDITING IS COMPLETED, THE OUTPUT CARDS OF VR-1 ARE USED AS VR-2 INPUT. AN ACCURATE VR-2 RUN PRODUCES TABLES AND CARDS CONTAINING RECOVERY VALUES AND VOLUMES THAT CAN BE USED TO--

1. DETERMINE VENEER GRADE RECOVERIES BY LOG GRADE AND DIAMETER

2. CALCULATE VENEER VOLUMES AND VALUES FOR COMBINATIONS OF VENEER GRADE AND VENEER SIZE

3. DETERMINE THE CUBIC VOLUMES OF THE LOG OR BLOCK, VENEER PRODUCED, UNPEELED CORE, REJECT VENEER, AND RESIDUAL DIFFERENCE, WHICH ARE TERMED CHIPPABLE

4. SUMMARIZE ALL RECOVERY VALUES BY BLOCK, LOG, OR TREE GRADE

5. CONVERT THE VENEER RECOVERY FROM INDIVIDUAL PEELER BLOCKS TO WOODS-LENGTH LOGS OR INTO THE ORIGINAL TREE-LENGTH UNIT

6. CONVERT VENEER RECOVERY TO OTHER THAN A 3/8-INCH BASIS

7. REPRICE VENEER RECOVERY VOLUMES

8. COMBINE RECOVERY VALUES FROM TWO OR MORE STUDIES EVEN THOUGH VENEER WAS PEELED IN DIFFERENT THICKNESSES

9. CALCULATE LOG SURFACE AREA AS ONE OF THE 'TRIO OF UNAMBIGUOUS PRIMARY UNITS OF MEASURE,' REFERRED TO BY GROSENBAUGH(*6)-- LENGTH, CUBIC VOLUME, AND SURFACE AREA

(*6) GROSENBAUGH, L. R. SOME SUGGESTIONS FOR BETTER SAMPLE TREE MEASUREMENT. SOC. AMER. FOREST. PROC., 1963, PP. 36-52. 1964.

10. PUNCH CARDS FOR THE POLY(*7) PROGRAM THAT CALCULATES FIRST, SECOND, AND THIRD DEGREE POLYNOMIAL EQUATIONS

11. CHECK FOR INVALID INPUT DATA AND IDENTIFY THESE TO THE USER WITH CODES AND PRINTED STATEMENTS

THE TWO VENEER RECOVERY PROGRAMS DESCRIBED IN THIS PAPER ARE IDENTIFIED AS VR-1 AND VR-2. PRELIMINARY PROCESSING IS DONE WITH VR-1 ON INDIVIDUALLY PEELED BLOCKS. A GRADE FOR THE PEELER BLOCK IS NOT INCLUDED IN VR-1. VR-2 PROVIDES THE USER WITH FURTHER PROCESSING OF RECOVERY DATA AND THE AVAILABILITY OF PROCESSING OPTIONS. BOTH PROGRAMS PRODUCE PRINTED TABLES AND PUNCHED CARDS. THESE ARE ILLUSTRATED IN THE RESPECTIVE PROGRAM OUTPUT SECTIONS OF THE REPORT. VR-1 WILL BE PROCESSED FIRST AND THE PUNCHED OUTPUT USED AS VR-2 INPUT.

FORTRAN IV IS THE PROGRAM LANGUAGE. PROCESSING IS CURRENTLY DONE BY THE BONNEVILLE POWER ADMINISTRATION ON AN IBM 7040 COMPUTER LOCATED IN THE FEDERAL BUILDING IN PORTLAND, OREGON. THE PROGRAM IS OPERATIONAL UNDER VERSION 9 OF THE IBSYS MONITOR SYSTEM. THE MACHINE REQUIREMENTS ARE BINARY ARITHMETIC AND 32K WORD CORE (A MINIMUM OF 36 BITS PER WORD).

INFORMATION TO MODIFY AND ADAPT THESE PROGRAMS INCLUDES FORTRAN IV SOURCE DECKS, FLOW CHARTS, VARIABLE SYMBOL DEFINITIONS, ARRAY NAMES, AND DIMENSIONS, TAPE ASSIGNMENTS, AND USES. THESE ITEMS MAY BE OBTAINED BY WRITING TO--

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MILL STUDY PROCEDURES USED IN COLLECTING THE VENEER RECOVERY DATA MAY ALSO BE OBTAINED FROM THE ABOVE ADDRESS.

(*7) THE POLY PROGRAM WAS DEVELOPED BY THE PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION'S BIOMETRICAL STAFF. A WRITEUP OF THE PROGRAM IS BEING PREPARED.

========== VR-1 INPUT ==========

DECKS FOR PROGRAM VR-1 RUNS INCLUDE--

1. CONTROL CARD - CT10
2. TITLE CARDS (OPTIONAL)
3. PRICE CARD (OPTIONAL)
4. VENEER BLOCK CARD - CT11
5. VENEER TALLY CARD(S) - CT12 (ONE OR MORE PER BLOCK WITH VENEER RECOVERY)
6. PROJECT TRAILER CARD (99 IN COLUMNS 1-2)
7. END OF RUN CARD (99 IN COLUMNS 1-2)

VENEER RECOVERY DATA ARE KEYPUNCHED INTO DATA CARD TYPES 11 AND 12.

A DESCRIPTION OF DATA CARDS, INSTRUCTIONS FOR THEIR PREPARATION, AND ORDER OF INPUT FOLLOW.

CONTROL CARD
============

COLUMN NO.	INFORMATION
1- 2	CARD TYPE CODE 10
3- 4	PROJECT OR RUN IDENTIFICATION NUMBER
5- 6	SPECIES CODE
7	1 IF PRICE CARD, 0 IF NO PRICE CARD
8-10	AVERAGE VENEER WIDTH FOR FULL SHEETS TALLIED (INCHES XXX)
11-13	AVERAGE VENEER WIDTH FOR HALF SHEETS TALLIED (INCHES XXX)
14	RANDOM WIDTHS OF VENEER--1 ALWAYS
15-16	NUMBER OF TITLE AND COMMENT CARDS
17-19	BLOCK LENGTH 1) A MAXIMUM OF
20-22	BLOCK LENGTH 2) FIVE PEELER BLOCK OR VENEER
23-25	BLOCK LENGTH 3) LENGTHS CAN BE HANDLED
26-28	BLOCK LENGTH 4) BY THE PROGRAM.
29-31	BLOCK LENGTH 5)
32-34	MINIMUM CUBIC VOLUME RECOVERY PERCENTAGE ACCEPTABLE
35-37	MAXIMUM CUBIC VOLUME RECOVERY PERCENTAGE ACCEPTABLE
38-39	MAXIMUM DIAMETER FOR THE STUDY OR RUN
40-41	MINIMUM DIAMETER FOR THE STUDY OR RUN
42-44	NOMINAL VENEER THICKNESS
45-80	BLANK

A PROJECT MAY CONTAIN FIVE THICKNESSES OF VENEER, BUT EACH MUST BE PROCESSED SEPARATELY ON VR-1 USING DIFFERENT THICKNESS CODES.

THE DIAMETER LIMITS ALLOW THE PROGRAM USER TO SET THE UPPER AND LOWER DIAMETER LIMITS FOR THE 1-INCH CLASSES IN THE DIAMETER CLASS TABLE. THE PROGRAM PROVIDES FOR UP TO 90 CLASSES FROM 1 TO 90 INCHES, WITH A BLANK DATA LINE FOR EACH DIAMETER CLASS.

THE MINIMUM AND MAXIMUM RECOVERY PERCENTAGE LIMITS ARE SET BY THE USER TO IDENTIFY A SPECIFIC RANGE.

A VR-1 RUN MAY INCLUDE FIVE PEELER BLOCK OR VENEER LENGTHS. THE USER SHOULD SELECT A BLOCK LENGTH CODE FOR EACH LENGTH EXPECTED OVER A SERIES OF STUDIES AND USE IT CONSISTENTLY. FOR EXAMPLE--1 FOR 8-FOOT BLOCKS, 2 FOR 4-FOOT BLOCKS AND CORE VENEER.

FIGURE 1 IS A SAMPLE PAGE FROM A COMPUTER RUN TO SHOW CONTROL CARD STUDY SPECIFICATIONS PRINTED IN THE OUTPUT. INFORMATION IN BRACKET 'A' IS FROM THE CONTROL CARD.

FIGURE 1.--SAMPLE PAGE FROM AN OUTPUT SHOWING CONTROL CARD STUDY SPECIFICATIONS.

```
PROJECT NO. 77          DATA IS FROM PNW EXPERIMENT STATION TIMBER QUALITY STUDIES ON VENEER        03/27/67  PAGE  1
                        RECOVERY VALUES AS COMPUTED BY ADP PROGRAM VR-1 FOR PROJECT STUDY ---
                        PROJECT 77 SHELTON, WASH.

                        THIS IS THE OUTPUT OF VENEER RECOVERY PROGRAM VR-1. THE PROGRAM PRINTS
                            THREE TABLES FOR THE PROJECT.

                          1 BLOCK SUMMARY BY PEELING ORDER.
                          2 TOTALS BY ONE-INCH DIAMETER CLASSES FOR ALL BLOCKS.
                          3 TOTALS BY GRADE AND VENEER ITEM ON 3/8 INCH SQ. FT.
                               BASIS FOR ALL BLOCKS.

                        ALL VENEER WAS PEELED 1/10 INCH.
                        AVERAGE VENEER THICKNESS MEASURED DURING STUDY
                            GREEN   .102
                            DRY   = 0.097 INCHES
                        AVERAGE DRY CLIPPED VENEER SIZES
                            FULL SHEETS (CODE 1)
                                52 INCHES
                            HALF SHEETS (CODE 2)
                                26 INCHES
                            RANDOM WIDTHS (CODE 3)

                            8-FOOT LENGTHS (CODE 1)
                                101 INCHES
                            4-FOOT LENGTHS (CODE 2)
                                52 INCHES

                        VENEER BLOCKS WERE SCALED BY FOREST SERVICE METHODS IN 8-FOOT LENGTHS.
                        VENEER WAS GRADED DRY-UNTRIMMED UNDER SUPERVISION OF AN AMERICAN PLYWOOD
                            ASSOCIATION GRADING SUPERVISOR.

                                    ⬇                ⬇                ⬇

                        THE FOLLOWING CHECKS ARE INDICATED BY CHECK CODES 1 TO 6.
                            CHECK 1 - FOUR TYPES OF CHECKS ARE INDICATED BY CODE 1.
                                  THE PROJECT NO. ON THE TALLY CARD DOES NOT MATCH THE PROJECT NO.
                                      ON THE CONTROL CARD.
                                  THE VENEER GRADE IS NOT CODED 1 TO 8.
                                  THE VENEER LENGTH DOES NOT MATCH ANY OF THE 1 TO 5 LENGTHS ON
                                      THE CONTROL CARD.
                                  THE VENEER WIDTH IS NOT CODED 1, 2, OR 3.
                            CHECK 2 -
                                  THE NET SCALE OF THE BLOCK IS ZERO.
                            CHECK 3 -
                                  THE LENGTH OF THE VENEER EXCEEDS THE LENGTH OF THE BLOCK.
                            CHECK 4 -
                                  THE RECOVERY PERCENTAGE EXCEEDS THE MAXIMUM SET ON THE CONTROL
                                      CARD.
                            CHECK 5 -
                                  THE RECOVERY PERCENTAGE EXCEEDS THE MINIMUM SET ON THE CONTROL
                                      CARD.
                            CHECK 6 -
                                  THE CUBIC VOLUME OF CHIPPABLE VENEER IS LESS THAN ZERO.

                            THE FOLLOWING IS A DUPLICATE OF THE CONTROL CARD FOR THIS OUTPUT
                      1D77011D52026183101052          D25D756510100

                            THE FOLLOWING CARD IS A DUPLICATE OF PRICE CARD FOR THIS OUTPUT
                      062890D68660D432B0049650038B10027980027980                          77801

SPECIES  1     NO. OF PRICE CARDS  1     PRICE SCHEDULE  1     VENEER WIDTH - FULL SHEET = 52  HALF SHEET = 26
PROJECT CONDITION 8     NO. OF TITLE CARDS 83     ONE-INCH DIAMETER CLASS - MAX=65 MIN=10
NOMINAL THICKNESS(1) .100                         CUBIC VOLUME RECOVERY PERCENT  MAX = 75. MIN = 25.
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B

A

TITLE CARDS

TITLE OR COMMENT CARDS PROVIDE DESCRIPTIVE INFORMATION ON AN INDIVIDUAL PROJECT OUTPUT. THESE ALPHAMERIC CARDS FOLLOW THE CONTROL CARD. THE NUMBER OF COMMENT CARDS IS PUNCHED IN COLUMNS 15-16 OF THE CONTROL CARD. A MAXIMUM OF 99 CARDS MAY BE USED. FIGURE 1 ILLUSTRATES THE INFORMATION THAT THE TITLE CARDS CONTAIN FOR A VENEER RECOVERY STUDY. ALL 80 COLUMNS MAY BE USED. INFORMATION IN BRACKET 'B' IS FROM THE TITLE CARDS.

PRICE CARD

THE VALUES OR PRICES ASSIGNED TO VENEER ITEMS ARE PUNCHED INTO THIS CARD. THE USER SPECIFIES IN THE CONTROL CARD IF PRICES ARE TO BE APPLIED.

THE FOLLOWING INFORMATION IS PUNCHED IN THE PRICE CARD--

COLUMN NO.	INFORMATION
1- 6	VENEER VALUE GRADE--A (CODE 1)
7-12	VENEER VALUE GRADE--A PATCH (CODE 2)
13-18	VENEER VALUE GRADE--B (CODE 3)
19-24	VENEER VALUE GRADE--B PATCH (CODE 4)
25-30	VENEER VALUE GRADE--C (CODE 5)
31-36	VENEER VALUE GRADE--D (CODE 6)
37-42	VENEER VALUE GRADE--E (CODE 7)
43-74	BLANK, NOT USED BY PROGRAM
75-76	PROJECT OR RUN IDENTIFICATION NUMBER
77	PRODUCT CONDITION
78-79	PRICE SCHEDULE
80	BLANK, NOT USED BY PROGRAM

EACH VENEER GRADE ENTERED ON VENEER TALLY CARD TYPE 12 MUST BE ON THE PRICE CARD, EXCEPT REJECT (GRADE CODE 8) VENEER. DECIMAL POINTS ARE NOT PUNCHED.(*8)

(*8) A DESCRIPTION OF THE VENEER CODING AND TALLY METHODS USED IN THESE STUDIES MAY BE OBTAINED BY WRITING THE PACIFIC NORTHWEST FOREST AND RANGE EXP. STA., PORTLAND, OREG.

BLOCK DATA CARD

THIS IS CARD TYPE 11. IT CONTAINS INFORMATION ON THE VENEER PEELER BLOCK. DECIMAL POINTS ARE NOT PUNCHED. THERE IS ONE CARD PER PEELER BLOCK.

COLUMN NO.	INFORMATION
1- 2	CARD TYPE CODE 11
3- 4	PROJECT OR RUN IDENTIFICATION NUMBER
5	PRODUCT TYPE CODE (IDENTIFICATION OF PRODUCT PRODUCED FOR STUDY)
6- 7	SPECIES CODE
8-12	BLOCK NUMBER
13-16	BLOCK PEELING SEQUENCE NUMBER
17-19	DIAMETER OF THE PEELER CORE (INCHES XX.X)
20	CORE USE
21	CHUCKING POSITION
22-24	ACTUAL BLOCK LENGTH (INCHES XXX.)
25-27	MAXIMUM BLOCK DIAMETERS LARGE END (INCHES XX.X)
28-30	MINIMUM BLOCK DIAMETERS LARGE END (INCHES XX.X)
31-33	AVERAGE BLOCK DIAMETERS LARGE END (INCHES XX.X)
34-36	MAXIMUM BLOCK DIAMETERS SMALL END (INCHES XX.X)
37-39	MINIMUM BLOCK DIAMETERS SMALL END (INCHES XX.X)
40-42	AVERAGE BLOCK DIAMETERS SMALL END (INCHES XX.X)
43-46	GROSS BLOCK SCALE (BD. FT. XXXX)
47-50	NET BLOCK SCALE (BD. FT. XXXX)
51-80	BLANK

CHUCKING POSITION IDENTIFIES THE POSITION OF THE LATHE CHUCK IN RELATION TO THE GROWTH CENTER OF THE PEELER BLOCK.

CORE USE IS ALSO A NONCOMPUTATION ITEM. IT IDENTIFIES THE USE THE VENEER MANUFACTURER MAKES OF THE UNPEELED PORTION OF THE PEELER BLOCK (THE VENEER CORE).

VENEER TALLY CARD

THIS IS CARD TYPE 12. THE VENEER RECOVERED FROM A PEELER BLOCK IS IDENTIFIED AND TALLIED BY SOME MEANS DURING THE STUDY. THIS RECOVERY IS PUNCHED INTO A CARD TYPE 12. EACH CT12 WILL TAKE FOUR QUANTITIES OR UNITS OF TALLIED VENEER, ANY GRADE IN ANY ORDER. A LIMITATION IS PLACED ON VENEER SIZE AND PEELING SEQUENCE IN THAT THE FOUR FIELDS MUST CONTAIN VENEER OF THE SAME WIDTH AND LENGTH CODE. THERE IS NO LIMITATION ON THE NUMBER OF TALLY CARDS PER PEELER BLOCK NEEDED TO CONTAIN THE TALLY OF VENEER.

THE FOLLOWING INFORMATION IS PUNCHED IN THE CARD--

COLUMN NO.	INFORMATION
1- 2	CARD TYPE CODE 12
3- 4	PROJECT OR RUN IDENTIFICATION NUMBER
5	VENEER CONDITION (CODED BY USER)
6- 7	SPECIES CODE
8-10	VENEER THICKNESS (INCHES .XXX)
11	VENEER WIDTH (SEE CODE) (DISTANCE BETWEEN CLIPPED EDGES OF VENEER)
12-14	VENEER LENGTH (INCHES XXX.) (CORRESPONDS TO BLOCK LENGTH)
15-18	PEELING SEQUENCE
19	VENEER GRADE (SEE CODE)
20-23	NUMBER OF SHEETS OR LINEAL WIDTH OF VENEER (INCHES XXXX.)
24	VENEER GRADE (SEE CODE)
25-28	NUMBER OF SHEETS OR LINEAL WIDTH OF VENEER (INCHES XXXX.)
29	VENEER GRADE (SEE CODE)
30-33	NUMBER OF SHEETS OR LINEAL WIDTH OF VENEER (INCHES XXXX.)
34	VENEER GRADE (SEE CODE)
35-38	NUMBER OF SHEETS OR LINEAL WIDTH OF VENEER (INCHES XXXX.)
39	VENEER THICKNESS PEELED IN STUDY AS 0.100 OR 0.125
40-80	BLANK

A TOTAL OF THREE SEPARATE CLASSES OF VENEER WIDTHS MAY BE CODED AND ARE SELECTED BY THE PROGRAM USER TO FIT THE CODE NUMBERS 1, 2, AND 3--

1--FULL SHEETS, SUCH AS 4 BY 8 FEET, OR OTHER CONSTANT WIDTH WITH WHICH THE STUDY MAY BE CONCERNED

2--HALF SHEETS, SUCH AS 2 BY 8 FEET, OR OTHER CONSTANT WIDTH

3--THE CLASS OF VENEER PIECES TERMED STRIPS, RANDOM, OR MIXED WIDTH

VENEER GRADES MAY BE CODED 1 TO 7, WITH CODE 8 USED FOR A GRADE, SUCH AS REJECT VENEER, THAT THE USER DOES NOT WANT INCLUDED IN RECOVERY VALUES.

THE LAST TWO CARDS FOLLOWING THE INPUT DATA MUST HAVE A 99 PUNCHED IN COLUMNS 1-2.

A CARD TYPE 11 IS NECESSARY FOR EACH BLOCK PEELED, AND THE VENEER TALLY CARDS FOR THIS BLOCK MUST FOLLOW THE BLOCK CARD. HOWEVER, WHEN THERE IS NO RECOVERY FROM A BLOCK, A CARD TYPE 11 WOULD NOT BE FOLLOWED BY ANY TALLY CARDS.

========== VR-2 INPUT ==========

DECKS FOR PROGRAM VR-2 RUNS INCLUDE--

1. CONTROL CARD - CT00
2. CT90 - PRECEDES ANY COMMENT CARDS
3. COMMENT CARD(S) (OPTIONAL)
4. CT91 - FOLLOWS ANY COMMENT CARDS
5. PRICE CARDS (OPTIONAL)
6. VARIABLE FORMAT CARD - THE SAME CARD IS USED FOR LOG OR BLOCK INPUT. A SEPARATE CARD IS USED FOR TREE INPUT
7. BLOCK, LOG, OR TREE CARD - CT20
8. CT13 - NONE, ONE, OR MORE FROM VR-1 OUTPUT OR PREVIOUS VR-2 OUTPUT
9. CT14 - MUST ALWAYS BE ONE OR MORE
10. CT15 - MUST ALWAYS BE SAME NUMBER AS CT14 FROM VR-1 OUTPUT OR PREVIOUS VR-2 OUTPUT
11. CT13 OR 14 - IF BLOCKS ARE BEING COMBINED TO FORM A LOG... OR CT20, IF A LOG HAS ONLY ONE BLOCK
12. CT99 - END OF PROJECT CARD - ONE AT THE END OF EACH PROJECT
13. CT99 - END OF RUN CARD - ONE ONLY FOR EACH RUN

THE INPUT CARDS FOR VR-2 ARE DESCRIBED IN THE ORDER THEY ARE USED AS PROGRAM INPUT.

CT13, 14, AND 15 MUST BE IN ASCENDING ORDER.

TREE, LOG, OR BLOCK NUMBERS MUST BE IN ASCENDING ORDER.

CONTROL CARD

A SINGLE CARD IS USED FOR EACH PROJECT OR STUDY. THE CARD CONTAINS THE FOLLOWING INFORMATION--

COLUMN NO.	INFORMATION
1- 2	CODE 00
3- 4	PROJECT OR RUN IDENTIFICATION NUMBER
5- 6	SPECIES CODE
7	NUMBER OF PRICE CARDS IF REPRICING (ONE PER THICKNESS PEELED)
8-16	BLANK--NOT USED BY PROGRAM
17-37	VENEER LENGTH--A TOTAL OF SEVEN VENEER LENGTHS MAY BE SUMMARIZED IN A SINGLE PROGRAM OUTPUT
38-40	MINIMUM PERCENT RECOVERY SET BY USER
41-43	MAXIMUM PERCENT RECOVERY SET BY USER
44-45	MINIMUM DIAMETER OF LOGS IN PROJECT
46-47	MAXIMUM DIAMETER OF LOGS IN PROJECT
48-62	VENEER THICKNESS--A TOTAL OF FIVE VENEER THICKNESSES MAY BE SUMMARIZED IN A SINGLE PROGRAM OUTPUT
63-64	LOG GRADING AND SCALING SYSTEM
65	0 TO RECALCULATE CUBIC VOLUMES AND SURFACE AREAS 1 TO ACCUMULATE THESE VOLUMES AND AREAS FROM INPUT CARDS THE ACCURACY OF CUBIC VOLUME AND SURFACE AREA ESTIMATES FOR LOGS AND TREES IS IMPROVED IF BLOCK VOLUMES AND AREAS ARE ACCUMULATED RATHER THAN RECALCULATED FOR THE LONGER ITEMS
66-67	BLANK, NOT USED BY PROGRAM
68-69	THE PROGRAM USER MUST SELECT ONE OF THE FOLLOWING FOR DIAMETER MEASUREMENTS-- 00 TO TRUNCATE DIAMETERS 04 TO ROUND DIAMETERS
70	PRODUCT CONDITION CODE SET BY USER (E.G., DRY VENEER 8 OR GREEN VENEER 9)
71-72	PRICE SCHEDULE CODE
73	1 IF OUTPUT IS FOR LOGS OR BLOCKS 2 IF OUTPUT IS FOR TREES
74-75	12 IF INPUT IS VR-1 OUTPUT 1 IF INPUT IS VR-2 OUTPUT
76-80	BLANK, NOT USED BY PROGRAM

MINIMUM AND MAXIMUM PERCENT RECOVERY IS A MEANS OF SELECTING THE VENEER RECOVERY PERCENTAGES TO WHICH THE PROGRAM USER WANTS TO CALL ATTENTION. VALUES OUTSIDE THE LIMITS WILL BE INDICATED WITH A 2 IN THE CHECK COLUMN OF THE PRINTED OUTPUT. THE CHECK IS NOT AN ERROR BUT ONLY NOTES THOSE PERCENTAGES THAT THE USER FEELS ARE HIGH OR LOW AND SHOULD BE REVIEWED.

DIAMETER RANGES FOR THE PRINTED TABLES ARE SPECIFIED WITH THE MINIMUM AND MAXIMUM DIAMETER OF THE LOG. NINETY DIAMETER CLASSES MAY BE USED.

TITLE CARDS (OPTIONAL)

TITLE OR COMMENT CARDS PROVIDE DESCRIPTIVE INFORMATION ON AN INDIVIDUAL PROJECT OUTPUT FOR VR-2 AS THEY DO FOR VR-1. A CARD WITH 90 IN COLUMNS 1 AND 2 PRECEDES ANY COMMENT CARDS AND A CARD WITH 91 IN COLUMNS 1 AND 2 FOLLOWS ANY COMMENT CARDS. COLUMNS 3-80 MAY BE USED FOR DESCRIPTIVE INFORMATION. CARDS ARE NOT COUNTED.

PRICE CARDS (OPTIONAL)

A SEPARATE PRICE CARD IS USED FOR EACH VENEER THICKNESS IN THE PROJECT. THE PRICE CARD FORMATS ARE THE SAME FOR VR-2 AND VR-1. IF PRICES USED IN VR-1 ARE TO BE USED IN VR-2, THEN VR-2 PRICE CARDS ARE NOT NECESSARY.

VARIABLE FORMAT CARD

THIS CARD IDENTIFIES TO THE PROGRAM THE ARRANGEMENT OF INFORMATION ON CARD TYPE 20. THE VARIABLE FORMAT CARD USED FOR TREES DIFFERS FROM THAT USED FOR LOGS OR BLOCKS.

CARD CONTENT WHEN UNIT IS A BLOCK OR LOG, COLUMNS 1 TO 40--
(2X,I2,I1,2X,I4,1X,I2,I1,3F3.1,I3,1X,I3)

CARD CONTENT WHEN UNIT IS A TREE, COLUMNS 1 TO 42--
(2X,I2,I1,2X,I3,2X,I2,I1,F3.0,2F3.1,I4,I4)

BLOCK, LOG, OR TREE CARD--CARD TYPE 20

A CARD TYPE 20 IS REQUIRED FOR EACH BLOCK, LOG, OR TREE ENTERED INTO VR-2 FOR WHICH A RECOVERY VOLUME IS TO BE DETERMINED. THE CARD CONTENT IS AS FOLLOWS--

COLUMN NO.	INFORMATION WHEN UNIT IS A BLOCK OR LOG	INFORMATION WHEN UNIT IS A TREE
1- 2	CODE CARD TYPE 20	SAME
3- 4	PROJECT NUMBER	SAME
5	PRODUCT TYPE	SAME
6- 7	BLANK	BLANK
8-11	LOG NUMBER	TREE NUMBER
12	BLANK	BLANK
13-14	GRADING OR SCALING SYSTEM	SAME
15	LOG OR BLOCK GRADE CODE	TREE GRADE CODE
16-18	LOG OR BLOCK LENGTH	TOTAL TREE HEIGHT OR HEIGHT TO A MERCHANTABLE DIAMETER
19-21	AVERAGE LARGE END DIAMETER	TREE DIAMETER AT MERCHANTABLE HEIGHT
22-24	AVERAGE SMALL END DIAMETER	TREE DIAMETER AT BREAST HEIGHT
25-28	GROSS LOG SCALE	GROSS TREE SCALE ACCUMULATED BY LOGS
29-32	NET LOG SCALE	NET TREE SCALE ACCUMULATED BY LOGS
33-80	BLANK	BLANK

CARD TYPE 13

THIS IS THE VR-1 OUTPUT CARD OR AN EARLIER VR-2 OUTPUT CARD. THERE MAY BE NONE, ONE, OR MORE OF THESE PER LOG OR TREE. FORMAT IS THE SAME AS DESCRIBED UNDER VR-1 OUTPUT.

CARD TYPE 14

THERE MUST BE ONE CT14 FOR EACH BLOCK, REGARDLESS OF WHETHER THE OUTPUT IS FOR BLOCKS, LOGS, OR TREES. WHEN A BLOCK IS PEELED WITH TWO OR MORE VENEER THICKNESSES, A CT14 AND A CT15 ARE REQUIRED FOR EACH THICKNESS. FORMAT IS THE SAME AS DESCRIBED UNDER VR-1 OUTPUT.

CARD TYPE 15

THE NUMBER OF CT15 CARDS MUST BE THE SAME AS THE NUMBER OF CT14 CARDS. FORMAT IS THE SAME AS DESCRIBED UNDER VR-1 OUTPUT.

A CARD TYPE 13 OR 14 WILL FOLLOW IF BLOCKS ARE BEING COMBINED TO FORM A LOG, OR A CARD TYPE 20 IF A LOG HAS ONLY ONE BLOCK.

A CARD WITH 9'S IN COLUMNS 1 AND 2 IS USED AT THE END OF EACH PROJECT. A CARD WITH 9'S IN COLUMNS 1 TO 6 IS ONLY REQUIRED AS THE END OF RUN CARD.

WHEN SEVERAL PROJECTS ARE RUN ON VR-2 AND ARE TO BE COMBINED INTO A SINGLE OUTPUT, CARD TYPES 13, 14, AND 15 ARE NOT PRODUCED. HOWEVER, CT16 AND POLY CARDS ARE PRODUCED.

WHEN PROJECTS ARE COMBINED, THE INPUT CARDS FOR A PROJECT MUST HAVE IDENTICAL IDENTIFICATION CODES, PRODUCT TYPES, SPECIES, AND GRADING OR SCALING SYSTEMS.

VR-2 SUBROUTINE OPERATIONS

PROGRAM VR-2 CONSISTS OF AN EXECUTIVE PROGRAM AND SEVEN SUBROUTINES. THE PROGRAM WILL NOT PROCESS IF THE EXECUTIVE PROGRAM OR ANY ONE OF THE SUBROUTINES IS MISSING.

EXECUTIVE PROGRAM--

1. READS THE CONTROL CARD, COMMENT CARD(S), PRICE CARD(S), AND THE FIRST DATA CARD, WHICH MUST BE A CT20

2. PRINTS THE PROJECT SPECIFICATION, THE COMMENTS, AND THE HEADINGS FOR THE FIRST TABLE

3. WRITES THE END OF RUN OR END OF PROJECT CODES ON TAPE AT THE END OF EACH PROJECT AND AT THE END OF THE RUN

4. TRANSFERS CONTROL TO SUBROUTINE LOG AFTER READING THE FIRST CT20

SUBROUTINE LOG--

1. READS ALL CARD TYPES 13, 14, AND 15 FOR A BLOCK, LOG, OR TREE

2. CHECKS THE DATA ERRORS DESCRIBED PREVIOUSLY

3. STORES THE MAXIMUM AND MINIMUM DIAMETER CLASSES IN EACH LOG GRADE AND STORES VENEER VOLUME BY VENEER GRADE, THICKNESS, WIDTH, AND LENGTH

4. ACCUMULATES TOTAL VALUE, GROSS AND NET SCALES, VENEER CUBIC VOLUME, REJECT CUBIC VOLUME, CORE CUBIC VOLUME, BLOCK SURFACE AREA, AND BLOCK LENGTHS FOR CARD TYPES 14 AND 15 FOR LOGS AND 17 AND 18 FOR TREES

5. TRANSFERS CONTROL TO SUBROUTINE ADD

SUBROUTINE ADD--

1. CALLS SUBROUTINE CONVER IF THE SQUARE-FOOT VOLUME IS TO BE CONVERTED TO ANOTHER BASE (I.E., NOT THREE-EIGHTHS INCH). CONVER RETURNS CONTROL TO ADD IMMEDIATELY AFTER PERFORMING THE CONVERSION

2. STORES ON TAPE THE VENEER SQUARE-FOOT VOLUMES BY LOG GRADE, VENEER GRADE, LENGTH, WIDTH, AND THICKNESS FOR PERCENT ITEM TABLE, AND STORES ON TAPE SQUARE-FOOT VOLUMES BY LOG GRADE, VENEER GRADE, AND DIAMETER CLASS FOR PERCENT RECOVERY TABLE

3. ACCUMULATES SQUARE-FOOT VOLUME BY VENEER GRADE, LENGTH, AND WIDTH FOR THE VENEER SUMMARY CARD CT13

4. PUNCHES THE SUMMARY CARDS (CARD TYPES 13, 14, AND 15 FOR LOGS AND 13, 17, AND 18 FOR TREES)

5. CALLS SUBROUTINE POLYIN TO PUNCH A CARD FOR EACH LOG OR TREE

SUBROUTINE SUM--

(SUBROUTINE SUM IS CALLED AFTER ALL THE CARDS FOR A PROJECT HAVE BEEN PROCESSED.)

1. COMPUTES AND PRINTS THE VALUES FOR THE SUMMARY TABLES

2. PUNCHES A PERCENT RECOVERY CARD (CT16) AND A 'POLY' CARD BY DIAMETER CLASS AND LOG GRADE AND BY DIAMETER CLASS FOR ALL LOG GRADES

SUBROUTINE POLYIN--

(PUNCHES THE CARDS FOR THE 'POLY-33' PROGRAM.)

SUBROUTINE CONVER--

(A DUMMY SUBROUTINE THAT CAN BE WRITTEN TO CONVERT VENEER SQUARE-FOOT VOLUMES FROM A 3/8-INCH BASE TO ANOTHER BASE.)

SUBROUTINE MPRICE--

(REPRICES THE VENEER SQUARE-FOOT VOLUMES.)

SUBROUTINE PERCNT--

(CALCULATES THE PERCENT RECOVERY BY VENEER GRADE. THE TOTAL PERCENT OF THE SEVEN VENEER GRADES IS SUBTRACTED FROM 100, AND THE REMAINDER (IF ANY) IS ADDED TO THE VENEER GRADE CONTRIBUTING THE GREATEST PERCENT.)

PROGRAM 'PCTITM'--

(THE PROGRAM PCTITM (PERCENT ITEM) IS CONSIDERED AN INTEGRAL PART OF VR-2 AND IS TO BE LOADED IMMEDIATELY AFTER THE DATA WHICH ARE BEING PROCESSED BY THE PROGRAM VR-2. THE PROGRAM PCTITM UTILIZES TAPE OUTPUT FROM VR-2 TO PRODUCE TABLES OF PERCENT RECOVERY BY LOG GRADE, VENEER GRADE, THICKNESS, LENGTH, AND WIDTH. SUBROUTINE STACK AND SUBROUTINE PERCNT MUST ALWAYS BE USED WITH THE PROGRAM.) SUBROUTINE STACK IS A DUMMY SUBROUTINE.

========== VR-1 OUTPUT ==========

THE OUTPUT FROM VR-1 CONSISTS OF THREE TYPES OF PRINTED TABLES AND THREE CARD TYPES. VR-1 IS A COMPLETE OUTPUT IN ITSELF BUT ALSO PROVIDES THE USER WITH DATA TO EDIT PRIOR TO MORE DETAILED TABULATIONS WITH VR-2. VR-1 OUTPUT IS USUALLY VR-2 INPUT.

THE FIRST OF THE THREE TABLES IS A LISTING OF INDIVIDUAL PEELER BLOCK RECOVERY VALUES IN THE ORDER OF PEELING. THE SECOND IS A SUMMARY OF BLOCK RECOVERY INFORMATION BY 1-INCH DIAMETER CLASSES. THE LAST TABLE SUMMARIZES VENEER ITEMS BY SIZE AND GRADE.

CARD TYPE 13 IS PRODUCED FOR ALL BLOCKS FROM WHICH VENEER IS RECOVERED AND CONTAINS VENEER ITEM VOLUMES. ADDITIONAL RECOVERY INFORMATION DEVELOPED BY VR-1 IS PUNCHED ON TWO CARDS PRODUCED FOR EACH BLOCK (CARD TYPES 14 AND 15).

DATA INPUT SPECIFICATIONS ARE PRINTED FROM ALPHAMERIC TITLE CARDS PLACED AHEAD OF THE PROGRAM SOURCE DECK. THIS INFORMATION IS PRINTED ON PAGES PRECEDING THE BLOCK SUMMARY TABLE. FIGURE 1 ILLUSTRATES THE INPUT SPECIFICATIONS AND INFORMATION. THE LAST THREE LINES OF INFORMATION IN FIGURE 1 ARE FROM THE CONTROL CARD AS SET BY THE USER. THE CONTROL CARD IS DISCUSSED UNDER THE VR-1 INPUT SECTION.

PRINTED OUTPUT PAGES ARE EACH IDENTIFIED BY PROJECT NUMBER, TABLE HEADING, DATE OF COMPUTER RUN, AND PAGE NUMBER.

BLOCK SUMMARY TABLE, VR-1

THE BLOCK SUMMARY TABLE FOR VR-1 IS ILLUSTRATED IN FIGURE 2. IT CONTAINS INDIVIDUAL BLOCK RECOVERY INFORMATION BY PEELING ORDER. INCLUDED ARE THE FOLLOWING--

BLOCK NO.--A FIVE-DIGIT NUMBER THAT IDENTIFIES THE PEELER BLOCK. THE FIRST TO THIRD DIGITS INDICATE THE TREE NUMBER, THE NEXT IS LOG NUMBER, AND THE LAST IS THE BLOCK NUMBER FROM THE LOG. NUMBER 10724 IDENTIFIES TREE 107, LOG 2, AND THE FOURTH OR TOP BLOCK FROM LOG NO. 2.

FIGURE 2.--BLOCK SUMMARY TABLE AS PRODUCED FROM VR-1.

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8LOCK SUMMARY TABLE 8Y PEELING ORDER

8LOCK NO.	AVE DIA SMALL	AVE DIA LARGE	8LK LGTH	VEN LGTH	SCALE GROSS	SCALE NET	PCT SOUND	8LOCK VOL-3/8	RECOV RATIO	8LOCK VALUES TOTAL	$/MVT	$/MN8S	CUBIC VOLS 8LOCK	CUBIC VOLS VENEER	PCT VEN CU RCV	CU VOL CHIPPABLE	PEEL NO	CHECKS
21422	45.1	50.0	103	101	760	670	88	1464	2.19	60.42	41.27	90.17	106.13	44.31	42	44.92	218	
20641	28.1	28.4	103	101	270	230	85	483	2.10	19.70	40.79	85.65	37.43	14.67	39	20.40	219	
11531	24.0	25.5	102	101	190	190	100	615	3.24	19.72	32.07	103.80	28.48	18.61	65	7.33	220	
17113	26.0	27.3	103	101	270	270	100	637	2.36	30.32	47.60	112.31	33.33	19.29	58	11.61	301	
11512	30.5	31.9	102	101	330	330	100	888	2.69	34.94	39.35	105.88	45.23	26.95	60	15.94	302	
21472	28.0	29.3	103	101	270	230	85	343	1.49	10.34	30.14	44.95	38.44	10.40	27	25.61	303	
20642	26.8	27.8	102	101	250	210	84	430	2.05	13.78	32.05	65.62	34.56	12.99	38	19.17	304	
21471	29.3	29.8	102	101	310	270	87	607	2.25	18.91	31.16	70.05	40.55	18.39	45	19.76	305	
18112	34.2	35.9	102	101	400	390	97	1160	2.97	48.63	41.92	124.69	57.07	35.20	62	19.47	306	
18122	31.7	32.0	102	101	360	180	50	608	3.38	21.80	35.86	121.13	46.96	18.43	39	26.05	307	
18123	31.0	31.2	103	101	330	110	33	452	4.11	16.43	36.35	149.38	45.28	13.72	30	26.88	308	
16712	22.3	23.9	102	101	170	170	100	464	2.73	18.41	39.68	108.29	24.72	14.06	57	8.32	309	
14171	28.3	29.3	105	101	270	230	85	195	0.85	5.77	29.60	25.10	39.59	5.92	15	31.20	310	5
16711	23.5	26.0	102	101	190	190	100	371	1.95	13.19	35.54	69.40	28.53	11.22	39	13.03	311	
16411	30.3	37.3	103	101	360	310	86	519	1.67	20.85	40.17	67.26	54.04	15.73	29	35.31	312	
16413	26.0	30.9	102	101	310	310	100	859	2.77	41.41	48.21	133.59	37.80	26.06	69	9.41	313	
11532	23.0	23.0	102	101	170	170	100	593	3.49	18.37	30.98	108.07	24.52	17.91	73	4.21	314	
18124	29.8	30.0	102	101	310			362	999.00	12.72	35.13	999.99	41.45	10.96	26	22.53	315	2
14122	50.6	54.3	102	101	940	790	84	1928	2.44	101.42	52.60	128.38	127.69	58.43	46	53.39	316	
21442	39.5	40.5	103	101	540	460	85	1121	2.44	40.86	36.45	88.82	74.92	33.97	45	38.59	317	
20141	35.1	35.9	102	101	400	370	92	861	2.33	32.59	37.85	88.07	58.60	26.08	45	25.16	318	
20643	24.1	27.4	102	101	210	190	90	413	2.17	14.48	35.06	76.21	30.92	12.55	41	16.10	319	
20142	34.7	34.8	102	101	400	370	92	1152	3.11	39.61	34.39	107.06	55.98	34.92	62	18.72	320	
18022	23.3	25.1	102	101	190	190	100	565	2.97	27.05	47.88	142.37	27.19	17.20	63	7.66	401	
18121	31.5	31.8	102	101	360	180	50	611	3.39	21.13	34.58	117.37	46.37	18.55	40	24.31	402	
20143	32.7	33.1	103	101	370	330	89	921	2.79	31.87	34.60	96.57	50.67	27.90	55	20.42	403	
17114	24.7	26.4	102	101	210	210	100	757	3.60	30.14	39.81	143.52	30.30	22.92	76	5.11	404	4
14121	53.3	54.8	103	101	1050	900	86	2506	2.78	122.19	48.76	135.77	136.79	75.91	55	52.95	405	
18111	36.5	39.9	102	101	460	300	65	683	2.28	27.15	39.75	90.51	67.88	20.75	31	35.84	406	
18114	32.1	33.5	102	101	370	190	51	695	3.66	27.17	39.09	142.98	49.90	21.03	42	22.19	407	
16412	30.3	30.5	102	101	330	330	100	740	2.24	30.78	41.59	93.26	42.85	22.36	52	15.67	408	
19822	31.5	32.0	102	101	360	330	92	543	1.65	18.19	33.50	55.13	46.81	16.46	35	27.38	409	
21443	42.3	42.5	103	101	640	440	69	1173	2.67	39.10	33.33	88.86	84.06	35.54	42	46.23	410	
16414	28.8	29.0	103	101	290	290	100	769	2.65	30.38	39.51	104.76	39.10	23.27	60	13.47	411	
17112	27.4	29.5	103	101	270	270	100	793	2.94	33.07	41.70	122.46	38.01	24.04	63	11.61	412	
16114	25.0	25.2	102	101	190	170	89	472	2.78	18.83	39.89	110.75	29.21	14.27	49	12.60	413	
14542	35.6	36.9	102	101	440	370	84	811	2.19	30.91	38.11	83.54	60.94	24.57	40	29.13	414	

AVE DIA SMALL LARGE--AVERAGE DIAMETER OF THE BLOCK TO NEAREST ONE-TENTH INCH.

BLK LGTH--LENGTH IN INCHES PEELED. A CONSTANT OR AVERAGE LENGTH MAY BE USED, OR DIFFERENT LENGTHS FOR EACH BLOCK.

VEN LGTH--SPURRED OR MAXIMUM LENGTH OF THE VENEER FROM THE BLOCK.

SCALE--GROSS AND NET--SCALE OF THE BLOCK TO THE NEAREST BOARD FOOT.

PCT SOUND--SOUNDNESS OF THE BLOCK AS DETERMINED BY DIVIDING THE NET SCALE BY THE GROSS SCALE AND EXPRESSING THE RESULT AS A PERCENTAGE.

BLOCK VOL-3/8--SQUARE-FOOT VOLUME OF VENEER RECOVERY FOR THE BLOCK EXPRESSED ON A 3/8-INCH BASIS.

RECOV RATIO--RATIO OF SQUARE FEET OF 3/8-INCH VENEER TO NET BLOCK SCALE. A RATIO OF 2.86 INDICATES 2.86 SQUARE FEET OF 3/8-INCH VENEER PRODUCED PER BOARD FOOT OF NET BLOCK SCALE.

BLOCK VALUES--

TOTAL--VALUE OF THE VENEER OBTAINED FROM THE BLOCK AS DETERMINED BY THE VENEER GRADE PRICE SCHEDULE USED.

$/MVT--VALUE PER THOUSAND SQUARE FEET OF 3/8-INCH VENEER TALLIED.

$/MNBS--VALUE PER THOUSAND BOARD FEET OF NET BLOCK SCALE.

CUBIC VOLS--

BLOCK--VOLUME IN CUBIC FEET CALCULATED BY SMALIAN'S FORMULA V = ((A + B)/2)(L)--IN WHICH V IS VOLUME, A IS THE AREA OF THE LARGE END, B IS THE AREA OF THE SMALL END, AND L THE ACTUAL BLOCK LENGTH.

VENEER--VOLUME BY GRADE OF THE VENEER RECOVERED FROM THE BLOCK. AVERAGE DRY VENEER THICKNESS WAS USED WITH ACTUAL DRY VENEER LENGTH TO COMPUTE THIS VALUE. THE THICKNESS AND LENGTH USED IN A COMPUTER RUN WOULD BE SHOWN IN THE TITLE CARD PRINTOUT AHEAD OF THE BLOCK SUMMARY TABLE.

PCT VEN CU RCV--VENEER RECOVERY EXPRESSED AS A PERCENTAGE OF THE CUBIC VOLUME OF THE BLOCK.

CU VOL CHIPPABLE--CUBIC VOLUME OF WOOD LEFT AFTER VENEER VOLUME, UNPEELED CORE VOLUME, AND REJECT VENEER ARE SUBTRACTED FROM THE BLOCK CUBIC VOLUME. THIS VOLUME WOULD THEN INCLUDE ROUNDUP, SPUR, AND CLIPPER WASTE. REJECT VENEER PERMITS THE PROGRAM USER TO ACCOUNT FOR VENEER REJECTED AS BELOW GRADE AT THE TIME RECOVERY IS TALLIED.

PEEL NO.--PEELING ORDER IDENTIFICATION NUMBER ASSIGNED TO THE BLOCK AT THE TIME OF PEELING.

CHECKS--CHECK CODES IDENTIFYING BLOCKS WITH THE CONDITIONS EXPLAINED LATER UNDER PROGRAM CHECKS.

DIAMETER CLASS TABLE, VR-1

THE DIAMETER CLASS TABLE FOR VR-1 IS TITLED 'TOTALS BY ONE-INCH DIAMETER CLASSES FOR ALL BLOCKS,' AND IS ILLUSTRATED IN FIGURE 3. INFORMATION PRESENTED IN DIAMETER CLASS TABLE, VR-1, BUT NOT IN BLOCK SUMMARY TABLE, VR-1, IS AS FOLLOWS--

BLOCK DIA--AVERAGE SMALL DIAMETER BY 1-INCH CLASSES. ALL DIAMETERS PUT INTO THE TABLE ARE ROUNDED (25.6 TO 26.5 IS IN THE 26-INCH CLASS). THERE IS NO ALTERNATIVE TO TRUNCATE.

NO. BLOCKS--NUMBER OF BLOCKS IN EACH DIAMETER CLASS.

VOLUMES IN CUBIC FEET--

REJECT--THIS INFORMATION HAS BEEN INCLUDED TO PERMIT A SEPARATE TALLY OF BELOW GRADE VENEER.

CORE--VOLUME OF THE CORE DROPPED FROM THE LATHE.

VENEER GRADE AND ITEM TABLE, VR-1

THE VENEER GRADE AND ITEM TABLE CONTAINS TOTALS BY GRADE AND VENEER ITEM ON 3/8-INCH, SQUARE-FOOT BASIS FOR ALL BLOCKS. AN EXAMPLE IS GIVEN IN FIGURE 4. THE PROGRAM PROVIDES FOR THE USE OF UP TO SEVEN VENEER GRADES. THIS DOES NOT INCLUDE REJECT VENEER. VENEER GRADE SYMBOLS, ACTUAL GRADES, AND TABLE HEADINGS ARE AS FOLLOWS--

A--A VENEER, AP--A PATCH VENEER

B--B VENEER, BP--B PATCH VENEER

C--C VENEER

D--D VENEER

E--D VENEER WITH WHITE SPECK ('FOMES PINI')

TOTAL--TOTAL SQUARE-FOOT VOLUME 3/8-INCH BASIS IN EACH VENEER ITEM CLASS

REJECT--BELOW GRADE VENEER

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TOTALS BY ONE-INCH DIAMETER CLASSES FOR ALL BLOCKS

BLOCK DIA	NO BLOCKS	SCALE GROSS	SCALE NET	PRCENT SOUND	BLOCK VOL-3/8	RECOV RATIO	BLOCK VALUES TOTAL	$/MVT	$/MBF	VOLUMES IN BLOCK	VOLUMES IN VENEER	CUBIC REJECT	FEET CORE	FEET CHIPPABLE	PCT VEN CU RECOV
10															
11	4	120	100	83	198	1.98	7.70	38.90	77.01	25.71	6.37	0.95	13.75	4.63	25
12	8	300	280	93	381	1.36	13.61	35.72	48.60	58.60	12.40	2.38	28.90	14.91	21
13	16	760	740	97	1412	1.91	52.83	37.42	71.39	141.18	45.78	3.87	57.85	33.67	32
14	15	820	810	99	1767	2.18	63.68	36.04	78.62	152.09	57.27	3.77	54.32	36.74	38
15	16	1030	940	91	2192	2.33	81.07	36.98	86.24	188.31	70.97	11.42	59.79	46.12	38
16	19	1400	1110	79	2535	2.28	86.11	33.97	77.58	252.24	82.27	14.82	72.85	82.31	33
17	14	1160	890	77	2728	3.07	93.79	34.38	105.38	204.66	88.63	9.02	67.40	39.61	43
18	14	1350	1180	87	3116	2.64	102.26	32.82	86.66	235.74	101.13	22.96	50.86	60.78	43
19	17	1950	1760	90	4151	2.36	133.70	32.21	75.96	312.83	134.59	38.38	72.31	67.55	43
20	13	1710	1670	98	4057	2.43	126.91	31.28	76.00	263.11	131.68	26.54	46.84	58.04	50
21	12	1740	1560	90	4067	2.61	129.01	31.72	82.70	274.61	132.10	26.83	43.53	72.14	48
22	13	2030	1710	84	4059	2.37	133.45	32.88	78.04	322.72	131.88	49.97	47.71	93.17	41
23	14	2320	2390	95	5428	2.27	179.49	33.07	75.10	383.26	176.52	50.06	52.82	103.85	46
24	12	2360	2170	92	5837	2.69	183.40	31.42	84.51	340.24	189.71	25.22	46.61	78.71	56
25	14	3000	2700	90	6147	2.28	215.92	35.13	79.97	434.11	199.42	49.97	56.24	128.48	46
26	17	4070	3530	87	8981	2.54	324.81	36.17	92.01	586.91	291.79	72.18	65.07	157.86	50
27	10	2600	2450	94	5790	2.36	188.76	32.60	77.05	370.65	188.07	49.22	35.65	97.71	51
28	14	3880	3540	91	8131	2.30	275.14	33.84	77.72	558.82	264.17	90.92	54.09	149.64	47
29	7	2110	2030	96	5187	2.56	167.03	32.20	82.28	288.42	168.51	39.94	25.22	54.76	58
30	14	4460	4220	95	9272	2.20	323.00	34.84	76.54	616.76	301.48	112.62	53.00	149.66	49
31	11	3830	3690	96	8618	2.34	308.30	35.77	83.55	526.14	279.93	96.50	41.85	107.86	53
32	17	6170	5460	88	14724	2.70	541.69	36.79	99.21	863.23	478.57	91.39	74.02	219.26	55
33	5	1930	1230	64	3782	3.07	129.50	34.24	105.29	274.65	122.85	38.09	21.46	92.25	45
34	12	4800	4190	87	11675	2.79	447.47	38.33	106.80	695.19	379.44	92.82	51.73	171.20	55
35	7	2940	2250	77	4373	1.94	162.46	37.15	72.21	423.99	141.93	84.36	43.49	154.22	33
36	6	2700	1560	58	5445	3.49	200.84	36.89	128.74	383.10	176.96	57.01	37.31	111.81	46
37	6	2860	2360	83	7317	3.10	292.75	40.01	124.05	405.91	237.75	36.10	34.89	97.16	59
38	6	3180	2680	84	7392	2.76	303.97	41.12	113.42	418.58	240.12	49.57	47.99	80.91	57
39	15	8410	6130	73	14477	2.36	591.28	40.84	96.46	1121.23	470.23	196.43	99.09	355.48	42
40	9	5320	4310	81	13452	3.12	608.48	45.23	141.18	731.47	437.15	59.32	56.67	178.33	60
41	3	1900	1310	69	2308	1.76	90.62	39.27	69.18	255.10	75.02	63.87	26.93	89.28	29
42	3	1950	1500	77	4131	2.75	199.35	48.26	132.90	278.45	134.16	53.98	23.63	66.68	48
43	4	2740	1820	66	6186	3.40	293.71	47.48	161.38	382.20	201.10	24.94	17.79	138.37	53
44	4	2930	1240	42	5578	4.50	239.46	42.93	193.11	403.51	181.32	42.93	20.58	158.67	45
45	2	1550	1280	83	936	0.73	34.67	37.05	27.09	199.81	30.44	69.19	9.39	90.79	15
46	3	2340	1600	68	5978	3.74	304.18	50.88	190.12	336.66	194.23	21.55	14.49	106.39	58
47	2	1650	1250	76	3277	2.62	125.62	38.33	100.49	212.86	106.49	48.17	7.17	51.03	50
48	2	1730	1240	72	3702	2.99	152.45	41.18	122.94	224.48	120.31	44.92	7.80	51.45	54
49	1	940	470	50	1411	3.00	49.78	35.28	105.91	143.60	45.84	2.24	15.37	80.14	32
50	2	1800	870	48	5460	6.28	252.08	46.17	289.75	260.99	177.45	1.64	19.02	62.88	68
51	2	1840	970	53	3278	3.38	159.73	48.73	164.67	283.46	106.46	52.64	18.13	106.23	38
52															
53	2	2180	1320	61	3501	2.65	92.58	26.44	70.14	299.06	113.74	60.98	9.24	115.10	38
54															
55	1	1090	660	61	1187	1.80	50.77	42.77	76.92	145.40	38.60	32.99	3.79	70.02	27
TOTAL	388	106150	85170	80	223624	2.63	8513.42	38.07	99.96	15280.05	7264.84	2022.69	1706.66	4285.86	48

FIGURE 3.--DIAMETER CLASS TABLE AS PRODUCED FROM VR-1.

FIGURE 4.--VENEER GRADE AND ITEM TABLE AS PRODUCED BY VR-1.

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TOTALS BY GRADE AND VENEER ITEM ON 3/8 INCH SQ. FT. BASIS FOR ALL BLOCKS

VENEER ITEM	A	AP	B	BP	C	D	E	TOTAL	REJECT
FULL SHEETS									
101 INCHES	5030	7632	1083	6330	8006	29305		57386	30
51 INCHES									
SUBTOTAL	5030	7632	1083	6330	8006	29305		57386	30
HALF SHEETS									
101 INCHES	6316	10792	672	14929	14869	64127	2762	114467	41547
51 INCHES									
SUBTOTAL	6316	10792	672	14929	14869	64127	2762	114467	41547
RANDOM WIDTHS									
101 INCHES	1310	38	2657	6860	14834	14197	687	40583	18727
51 INCHES					7255	3927	6	11188	1953
SUBTOTAL	1310	38	2657	6860	22089	18124	693	51771	20680
TOTAL	12656	18462	4412	28119	44964	111556	3455	223624	62257

END OF RUN

VENEER ITEM--THE PROGRAM PROVIDES FOR THREE WIDTH CLASSES AND FIVE LENGTH CLASSES OF VENEER. THE FOLLOWING WERE USED IN THIS WORK--

FULL SHEETS--THIS IS VENEER APPROXIMATELY 4 FEET WIDE, WITH ONE TO FIVE LENGTH CLASSES AS INDICATED BY 102 AND 52 INCHES IN THE SUBHEADING.

HALF SHEETS--THIS IS VENEER APPROXIMATELY 2 FEET WIDE, WITH ONE TO FIVE LENGTH CLASSES AS INDICATED IN THE SUBHEADING.

RANDOM WIDTHS--THIS IS VENEER OF VARYING WIDTHS UP TO HALF-SHEET SIZE WITH ONE TO FIVE LENGTH CLASSES AS INDICATED IN THE SUBHEADING.

TOTAL--THE TOTAL SQUARE FEET OF VENEER IN EACH GRADE ON A 3/8-INCH BASIS.

END OF RUN--THIS STATEMENT INDICATES COMPLETION OF THE COMPUTER RUN.

CARD TYPE 13

A CARD IS PRODUCED FOR EACH VENEER WIDTH AND LENGTH CLASS IN WHICH A BLOCK HAS VENEER RECOVERY. A MAXIMUM OF 15 CARDS IS POSSIBLE (THREE WIDTHS BY FIVE LENGTHS).

THE FOLLOWING INFORMATION IS PUNCHED IN THE CARD--

COLUMN NO.	INFORMATION
1- 2	CARD TYPE 13
3- 4	PROJECT OR RUN IDENTIFICATION NUMBER
5	PRODUCT TYPE CODE
6- 7	SPECIES CODE
8-12	BLOCK NUMBER
13	VENEER WIDTH CODE (ONE TO THREE)
14	VENEER LENGTH CODE (ONE TO FIVE)
	VENEER VOLUME--SQUARE-FOOT, 3/8-INCH BASIS FOR--
15-19	VENEER GRADE 1 (A)
20-24	VENEER GRADE 2 (AP)
25-29	VENEER GRADE 3 (B)
30-34	VENEER GRADE 4 (BP)
35-39	VENEER GRADE 5 (C)
40-44	VENEER GRADE 6 (D)
45-49	VENEER GRADE 7 (E)
50-54	VENEER GRADE 8 (REJECT)
55-80	BLANK

CT13 WILL BE A VR-2 INPUT CARD.

CARD TYPE 14

A SINGLE CARD IS PRODUCED FOR EACH BLOCK PEELED, REGARDLESS OF VENEER RECOVERY. ITEMS PUNCHED IN THE CARD ARE AS FOLLOWS--

COLUMN NO.	INFORMATION
1- 2	CARD TYPE 14
3- 4	PROJECT OR RUN IDENTIFICATION NUMBER
5	PRODUCT TYPE CODE
6- 7	SPECIES CODE
8-12	BLOCK NUMBER
13-16	DIAMETER SMALL END
17-20	DIAMETER LARGE END
21-23	MAXIMUM LENGTH FOR VENEER
24-27	GROSS BLOCK SCALE
28-31	NET BLOCK SCALE
32-34	PERCENT SOUND (PCT SOUND IN TABLE 1)
35-39	VENEER RECOVERY FOR PEELER BLOCK ON A 3/8-INCH, SQUARE-FOOT BASIS, TOTALED FOR GRADE CODES 1 TO 7
40-45	RECOVERY RATIO (RECOV RATIO IN TABLE 1)
46-52	TOTAL BLOCK VALUE
53-58	VALUE/M SQUARE FEET VENEER TALLY, 3/8-INCH BASIS
59-64	VALUE/M BOARD FEET NET BLOCK SCALE
65-80	BLANK

DECIMAL POINTS ARE PUNCHED.

LOGS WITH A NET SCALE OF ZERO, I.E., CULL LOGS, MAY BE PROCESSED IN THE PROGRAM. THE PRINTOUT WILL SHOW PERCENT SOUND AS ZERO AND RECOVERY RATIO AS 999.

CT14 WILL BE A VR-2 INPUT CARD.

CARD TYPE 15

A SINGLE CARD IS PRODUCED FOR EACH VENEER BLOCK PEELED. THE ITEMS PUNCHED IN THE CARD ARE AS FOLLOWS--

COLUMN NO.	INFORMATION
1- 2	CARD TYPE 15
3- 4	PROJECT OR RUN IDENTIFICATION NUMBER
5	PRODUCT TYPE CODE
6- 7	SPECIES CODE
8-12	BLOCK NUMBER
13-16	DIAMETER SMALL END
17-20	DIAMETER LARGE END

21-23	ACTUAL BLOCK LENGTH
24-26	PERCENT SOUND (PCT SOUND IN BLOCK SUMMARY TABLE)
27-32	PEELER BLOCK VOLUME - CUBIC FEET
33-38	VENEER VOLUME RECOVERED IN GRADE CODES 1 TO 7 - CUBIC FEET
39-44	VENEER VOLUME RECOVERED IN GRADE CODE 8 - CUBIC FEET
45-50	CORE VOLUME - CUBIC FEET
51-56	CHIPPABLE VOLUME - CUBIC FEET (DIFFERENCE BETWEEN BLOCK CUBIC VOLUME AND VENEER, CORE, AND REJECT CUBIC VOLUME)
57-59	CUBIC VOLUME VENEER RECOVERY PERCENT
60-65	BLOCK SURFACE AREA IN SQUARE FEET
66-80	BLANK

DECIMAL POINTS ARE PUNCHED.

VENEER GRADES BY CODES ARE SHOWN ON PAGE 8 UNDER PRICE CARD HEADING.

CT15 WILL BE A VR-2 INPUT CARD.

PROGRAM CHECKS

PROGRAM VR-1 OPERATES WITH THREE TYPES OF CONDITION CHECKS--RUN TERMINATED, PRINTED CHECK STATEMENTS, AND NUMERICAL CHECK CODES.

A RUN WILL TERMINATE WHEN--

1. A CONTROL CARD, CARD TYPE 10, IS MISSING

2. THE PROJECT OR RUN IDENTIFICATION NUMBER ON THE PRICE CARD DOES NOT MATCH THE NUMBER ON THE CONTROL CARD

3. THE FIRST CARD TYPE 11 PROJECT NUMBER DOES NOT MATCH THE NUMBER ON THE CONTROL CARD

4. THE FIRST CARD FOLLOWING THE PRICE CARD IS NOT A CARD TYPE 11

PRINTED STATEMENTS SHOW UP ON THE DATA LINE THEY REFER TO. STATEMENTS 2, 3, AND 4 MAY INDICATE THE NEED FOR A RERUN. THE PRINTED CHECK STATEMENTS ARE AS FOLLOWS--

1. NO TALLY CARDS (CARD TYPE 12)--THIS INDICATES NO VENEER WAS RECOVERED FROM THE BLOCK

2. TALLY CARD (CARD TYPE 12) PEELING SEQUENCE NUMBER DOES NOT MATCH THE BLOCK CARD (CARD TYPE 11) PEELING SEQUENCE NUMBER

3. NO BLOCK CARD (CARD TYPE 11) PRECEDES A CHANGE IN PEELING SEQUENCE NUMBER

4. PEELING SEQUENCE NUMBER IS NOT IN ASCENDING ORDER

NUMERICAL CHECK CODES APPEAR UNDER THE HEADING 'CHECKS.' NUMBERS 1 AND 6 MAY INDICATE THE NEED FOR A RERUN. NUMERICAL CHECK CODES IN THE BLOCK SUMMARY AND DIAMETER CLASS TABLES INDICATE THE FOLLOWING CONDITIONS--

NO. 1--INPUT IDENTIFICATION NUMBER ON CT12 DOES NOT MATCH IDENTIFICATION NUMBER ON THE CONTROL CARD, OR--

VENEER GRADE CODE IS INCORRECT
VENEER LENGTH DOES NOT MATCH ANY OF THE ONE TO FIVE LENGTHS SET ON THE CONTROL CARD
VENEER WIDTH CLASSES ARE NOT CODED CORRECTLY

NO. 2--NET SCALE OF THE BLOCK IS ZERO

NO. 3--VENEER LENGTH EXCEEDS BLOCK LENGTH

NO. 4--RECOVERY PERCENTAGE EXCEEDS MAXIMUM USER SET ON CONTROL CARD

NO. 5--RECOVERY PERCENTAGE IS LESS THAN MINIMUM USER SET ON CONTROL CARD

NO. 6--THE CUBIC VOLUME OF CHIPPABLE WOOD IS NEGATIVE

PROGRAM RESTRICTIONS

SEVERAL RESTRICTIONS AND LIMITATIONS MUST BE OBSERVED FOR CORRECT OPERATION OF THE PROGRAM--

1. PEELED VENEER THICKNESS MUST BE THE SAME FOR ALL PEELER BLOCKS COMPILED ON EACH VR-1 RUN. VENEER RECOVERY BY ONLY ONE VENEER THICKNESS CAN BE RUN AT A TIME. WHEN MORE THAN ONE THICKNESS HAS BEEN PEELED, A SEPARATE RUN IS MADE FOR EACH THICKNESS BY CHANGING VENEER THICKNESS CODE IN THE CONTROL CARD (CT10).

2. THE PROGRAM WILL RECOGNIZE ONLY THREE VENEER WIDTH CLASSES--FOR EXAMPLE, FULL SHEETS (4 BY 8 FEET), HALF SHEETS (2 BY 8 FEET), AND RANDOM WIDTHS.

3. A TOTAL OF FIVE BLOCK LENGTHS AND/OR VENEER LENGTHS MAY BE INCLUDED IN A RUN. THE PROGRAM WILL NOT ACCOMMODATE A GREATER NUMBER OF LENGTHS.

4. THE VR-1 PROGRAM DOES NOT PRODUCE RECOVERY TABLES BY BLOCK GRADES. THIS IS PROVIDED FOR IN VR-2 AND IS DESCRIBED LATER IN THIS REPORT.

OPERATING TIME

THE TIME REQUIRED TO PROCESS A RUN ON THE IBM 7040, WITH HIGH-SPEED TAPES, VARIES FROM 6 TO 8 MINUTES FOR A STUDY WITH 250 TO 300 BLOCK CARDS (CT11) AND 3,000 TO 4,000 VENEER TALLY CARDS (CT12). THIS INCLUDES COMPILATION FROM A SOURCE DECK ON A COMPILE-AND-GO BASIS. ABOUT 3 TO 4 MINUTES ARE REQUIRED TO COMPUTE VALUES, PRINT TABLES OFF LINE, AND PUNCH OUTPUT CARDS.

========== VR-2 OUTPUT ==========

VR-2 OUTPUT INCLUDES PRINTED TABLES AND PUNCHED CARDS. THE FIRST PRINTED PAGE CONTAINS RUN IDENTIFICATION AND SPECIFICATIONS CONTAINED IN THE CONTROL CARD. ALPHAMERIC TITLE CARDS ARE PRINTED AS PREPARED BY THE PROGRAM USER. AN EXAMPLE OF THE PRINTED OUTPUT PAGE 1 IS SHOWN IN FIGURE 5.

BLOCK OR SUMMARY TABLE, VR-2

THIS SUMMARY TABLE IS ILLUSTRATED IN FIGURE 6. THIS TABLE IS A SUMMARY BY LOG NUMBERS AND IS NEARLY IDENTICAL TO THE BLOCK SUMMARY TABLE IN VR-1 OUTPUT, FIGURE 2. THE DIFFERENCE IS THE INCLUSION OF A VENEER BLOCK, LOG, OR TREE GRADE FOR EACH ITEM IN THE SUMMARY TABLE. THIS TABLE IS PRODUCED WHETHER PEELER BLOCKS ARE USED AS THE LOG UNIT, COMBINED INTO LONG LOGS, OR COMBINED INTO AN ENTIRE TREE. ADDITIONAL HEADINGS FOR THIS TABLE ARE--

GRADING AND SCALING SYSTEM--A CODE TO IDENTIFY THE SCALING AND GRADING METHOD

LOG GRADE--THE GRADE OF THE BLOCK OR LENGTH SHOWN IN THE OUTPUT. GRADE IS ASSIGNED TO THE BLOCK OR LOG BY THE STUDY PERSONNEL

TREE SUMMARY TABLE, VR-2

WHEN PEELER BLOCKS OR LOGS ARE COMBINED INTO TREES, THE PROGRAM CONTROL CARD PROVIDES FOR CHANGES IN TABLE HEADINGS AS SHOWN IN FIGURE 7. NEW HEADINGS FOR THIS TREE SUMMARY TABLE ARE--

TREE GRADE--A GRADE ASSIGNED TO THE ENTIRE TREE (REPLACES LOG GRADE)
DBH--DIAMETER BREAST HIGH OF THE TREE (REPLACES SMALL END LOG DIAMETER)
TOP--MERCHANTABLE TOP DIAMETER, A USER'S OPTION (REPLACES LARGE END LOG DIAMETER)
TREE LENGTH--UTILIZED LENGTH OF THE TREE, ALSO A USER'S OPTION (REPLACES LOG LENGTH)

THE PROGRAM PROVIDES THE USER WITH A CONTROL CARD OPTION TO USE WHEN DEVELOPING CUBIC VOLUMES OF LOGS AND TREES FOR THE VR-2 BLOCK, LOG, OR TREE SUMMARY TABLE. VOLUMES OF INDIVIDUAL BLOCKS MAY BE ACCUMULATED FOR A LOG OR TREE FROM CARD TYPE 15'S (VR-1 OUTPUT AS VR-2 INPUT). THE PROGRAM USER MAY RECALCULATE VOLUMES, USING DIAMETERS AND LENGTHS SHOWN ON THE CARD TYPE 20 LOG CARD FOR THE LOG OR TREE UNIT.

FIGURE 5.--SAMPLE PAGE FROM A VR-2 OUTPUT SHOWING STUDY SPECIFICATIONS.

```
PROJECT NO. 82                          GRADING AND SCALING SYSTEM  I                          03/08/67   PAGE

                                        PROJECT SPECIFICATIONS

                                        SPECIES   I
                                        NUMBER OF PRICE CARDS
                                        LENGTHS IN FEET    (1)   8 (2)  4 (3)  7 (4)  6 (5)  3 (6)    (7)
                                        THICKNESSES (N INCHES (1) .1CO (2)**** (3)**** (4)**** (5)****
                                        CUBIC VOLUME RECOVERY PERCENT   MIN =   1  MAX = ICC
                                        DIAMETER CLASS    MIN = 1C  MAX = 70
                                        LCG  GRADING AND SCALING SYSTEM  I
                                        PRODUCT CONDITION  8
                                        PRICE SCHEDULE     1
                                        LCG  DIAMETER TRUNCATED

     DATA IS FROM PNW EXPERIMENT STATION TIMBER QUALITY STUDIES ON VENEER
     RECOVERY VALUES AS COMPUTED BY ADP PROGRAM VR-2 FOR PROJECT STUDY ---
     PROJECT 82

---NOTE-----
     RECOVERY RATIO (RECOV RATIO) IS BASED ON DRY UNTRIMMED VENEER VOLUME
     AND NET LOG SCALE.

     AVERAGE VENEER THICKNESS MEASURED DURING STUDY
         GREEN  C.IO5
         DRY      .C99

     AVERAGE DRY CLIPPED VENEER SIZES
         FULL SHEETS (CODE 1)
             53 INCHES
         HALF SHEETS (CODE 2)
             27 INCHES
         RANDOM WIDTHS (CODE 3)
         8-FOOT LENGTHS (CODE 1)
             ICI INCHES
         4-FOOT LENGTHS (CODE 2)
             5C INCHES
         7-FOOT LENGTHS (CODE 3)
              88 INCHES
         6-FOOT LENGTHS (CODE 4)
              77 INCHES
         3-FOOT LENGTHS (CODE 5)
             38 INCHES

     VR-2 PRINTS THE FOLLOWING TABLES
         LOG SUMMARY BY LOG NUMBER (OR TREES).
         TOTALS BY ONE INCH DIAMETER CLASSES (EACH LOG GRADE AND ALL GRADES).
         PERCENT RECOVERY BY ONE INCH DIAMETER CLASSES (EACH LOG GRADE AND
         ALL GRADES).
         PERCENT RECOVERY BY VENEER ITEM (EACH LOG GRADE AND ALL GRADES).

     LOGS WERE SCALED ACCORDING TO FOREST SERVICE SPECIFICATIONS FOR
     OCLOGLAS FIR, REVISED 3/65

     LOG GRADE CODES ARE -  1 = NO. I PEELER     5 = NO. I SAWMILL
                            2 = NO. 2 PEELER     6 = NO.2 SAWMILL
                            3 = NO. 3 PEELER     7 = NO. 3 SAWMILL
                            4 = SPECIAL PEELER   9 = CULL LOG

     THE FOLLOWING CONDITIONS ARE INDICATED BY CHECK CODES.
         CHECK I - THE TOTAL BLOCK LENGTHS ARE + OR - 5 PERCENT
     OF THE LOG LENGTH.
         CHECK 2 - THE PERCENT RECOVERY IS OUTSIDE THE LIMITS SET ON THE
         CONTROL CARD.

     THE FOLLOWING CARD IS A DUPLICATE OF CONTROL CARD FOR THIS OUTPUT.

8201          0080G4CC70C6003      0011001070100            011  C080II12
```

FIGURE 6.--BLOCK OR LOG SUMMARY TABLE AS PRODUCED BY VR-2.

PROJECT NO. 79 — GRADING AND SCALING SYSTEM 1 — 01/03/67 — PAGE 3

LOG SUMMARY BY LOG NUMBER

LOG NO.	LOG GR	DIAMETER SML	DIAMETER LRG	LOG LNTH	SCALE GROSS	SCALE NET	PCT SND	VOLUME LOG -3/8	RECOV RATIO	LOG TOTAL	VALUES $/MVT	$/MNLS	VOLUMES IN CUBIC FEET LOG	VOLUMES IN CUBIC FEET VENEER	VOLUMES IN CUBIC FEET CHIPPABLE	PCT VENEER CHECKS CU	PCT VENEER CHECKS RCV
11	3	28.0	35.0	26.0	950	820	86	2407	2.94	89.78	37.30	169.49	135.23	70.54	34.79		52
12	6	24.0	28.0	34.0	860	860	100	3541	4.12	121.30	34.26	141.05	139.55	103.35	20.40		74
13	6	20.0	24.0	34.0	600	600	100	2019	3.36	60.78	30.10	101.30	100.57	58.88	23.33		59
14	6	14.0	20.0	34.0	240	240	100	1046	4.36	33.24	31.78	138.50	61.54	30.81	13.65		50
21	1	50.0	60.0	17.0	1990	1870	94	5431	2.90	228.25	42.03	122.06	275.36	159.10	94.41		58
22	2	48.0	50.0	17.0	1840	1770	96	5515	3.12	222.27	40.30	125.58	238.29	161.50	60.99		68
23	6	46.0	48.0	26.0	2580	2580	100	6473	2.51	235.45	36.37	91.26	325.91	188.72	73.38		58
24	6	39.0	46.0	34.0	2380	2260	95	4812	2.13	156.03	32.43	69.04	342.45	140.79	105.33		41
25	6	32.0	39.0	34.0	1560	1400	90	1632	1.17	51.06	31.29	36.47	243.08	47.87	77.77		20
26	7	23.0	32.0	26.0	610	490	80	267	0.54	8.34	31.24	17.02	112.95	8.06	49.15		7
27	7	19.0	23.0	17.0	250	230	92	311	1.35	9.75	31.35	42.39	44.27	9.11	17.80		21
61	4	22.0	33.0	34.0	710	600	85	1552	2.59	60.50	38.98	100.83	116.83	45.38	56.12		39
62	4	20.0	22.0	34.0	600	600	100	2135	3.56	91.69	42.95	152.82	91.44	62.32	16.37		68
63	6	18.0	20.0	26.0	350	350	100	1020	2.91	33.15	32.50	94.71	53.08	29.80	12.90		56
64	6	17.0	18.0	17.0	190	140	74	312	2.23	9.11	29.20	65.07	29.42	9.15	11.36		31
91	1	37.0	45.0	17.0	1090	850	78	3577	4.21	157.15	43.93	184.88	161.40	104.22	43.76		65
92	3	35.0	37.0	26.0	1420	1300	92	4219	3.25	160.64	38.08	123.57	187.28	123.14	38.17		66
93	6	31.0	35.0	34.0	1510	1510	100	4974	3.29	149.89	30.13	99.26	216.58	145.16	48.49		67
94	6	28.0	31.0	26.0	950	950	100	2920	3.07	84.50	28.94	88.95	131.23	85.21	32.03		65
95	6	24.0	28.0	26.0	660	660	100	2105	3.19	59.42	28.23	90.03	103.79	61.49	24.28		59
97	6	20.0	23.0	17.0	290	230	79	323	1.40	9.81	30.37	42.65	45.90	9.63	22.02		21
99	6	17.0	19.0	8.0	90	90	100	127	1.41	3.60	28.35	40.00	16.51	3.72	5.25	1	23
141	3	28.0	37.0	26.0	950	890	94	2933	3.30	136.48	46.53	153.35	135.12	85.49	36.07		63
142	6	25.0	28.0	26.0	750	750	100	2502	3.34	92.93	37.14	123.91	102.45	73.08	15.26		71
143	4	22.0	25.0	34.0	710	710	100	2444	3.44	110.19	45.09	155.20	111.36	71.33	25.75		64
144	6	19.0	22.0	34.0	510	510	100	1757	3.45	52.72	30.01	103.37	87.40	51.23	20.66		59
145	6	17.0	19.0	17.0	190	180	95	759	4.22	25.94	34.18	144.11	33.51	22.33	4.27		67
231	4	19.0	24.0	34.0	510	510	100	1304	2.56	49.97	38.32	97.98	83.38	38.26	31.50		46
232	6	17.0	19.0	34.0	390	390	100	1368	3.51	51.55	37.68	132.18	65.66	39.85	12.31		61
233	6	14.0	17.0	34.0	240	240	100	700	2.92	25.04	35.77	104.33	50.92	20.51	16.16		40
234	6	13.0	14.0	17.0	100	100	100	244	2.44	7.45	30.53	74.50	18.95	7.20	4.18		38
281	4	19.0	26.0	34.0	510	510	100	1726	3.38	64.57	37.41	126.61	88.21	50.47	21.38		57
282	6	17.0	19.0	34.0	390	390	100	1384	3.55	45.59	32.94	116.90	67.23	40.37	13.58		60
283	6	14.0	17.0	34.0	240	240	100	821	3.42	24.14	29.40	100.58	50.52	24.06	10.54		48
301	6	33.0	43.0	34.0	1670	1470	88	3932	2.67	115.70	29.43	78.71	263.26	115.33	68.42		44
302	7	29.0	33.0	34.0	1290	1030	80	1783	1.73	54.67	30.66	53.08	190.77	52.13	40.85		27

FIGURE 7.--TREE SUMMARY TABLE PRODUCED BY VR-2.

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TREE SUMMARY BY TREE NUMBER

TREE NO.	GR	TREE DIAMETER TOP	OUB	LNTH	SCALE GROSS	NET	PCT SND	VOLUME TREE-3/8	RECOV RATIO	TREE VALUES TOTAL	$/MVT	$/MNLS	VOLUMES IN CUBIC FEET TREE	VENEER	CHIPPABLE	PCT VENEER CHECKS CU	RCV	
4	6	18.0	38.4	115	3060	2970	97	7953	2.68	257.17	32.34	86.59	448.53	255.99	147.05	57		1
8	6	14.0	19.7	350	240	240	100	724	3.02	25.17	34.77	104.87	48.53	23.27	15.92	48		1
10	4	12.0	22.9	88	820	790	96	2505	3.17	85.05	33.95	107.66	143.50	80.67	39.99	56		1
14	6	11.0	22.8	97	660	640	97	1857	2.90	64.91	34.95	101.42	127.67	59.86	42.66	47		1
18	4	12.0	29.2	115	1360	1160	85	4487	3.87	148.64	33.13	128.14	239.91	144.38	64.02	60		1
21	4	14.0	25.6	88	970	910	94	3028	3.33	101.82	33.63	111.89	165.32	97.27	45.68	59		1
23	7	11.0	16.8	54	270	250	93	673	2.69	24.41	36.27	97.64	51.75	21.68	16.87	42		
29	6	12.0	21.6	70	470	450	96	1615	3.59	57.70	35.73	128.22	93.23	52.04	23.81	56		1
32	6	12.0	22.3	70	510	460	90	1541	3.35	53.05	34.43	115.33	99.89	49.50	31.30	50		1
40	3	16.0	50.4	123	4500	3680	82	10062	2.73	452.96	45.02	123.09	697.82	324.01	297.32	46		1
43	3	25.0	47.8	62	1940	1470	76	4591	3.12	217.92	47.47	148.24	292.18	147.75	92.42	51		1
47	4	12.0	32.1	115	1500	1330	89	4428	3.33	164.39	37.13	123.60	264.71	142.62	73.68	54		1
52	3	22.0	50.1	149	5650	5000	88	16501	3.30	605.90	36.72	121.18	807.80	531.01	224.09	66		1
56	3	16.0	34.8	124	2060	1760	85	6324	3.59	235.22	37.19	133.65	337.23	203.27	100.57	60		1
59	3	31.0	53.6	81	4160	3800	91	10819	2.85	404.16	37.36	106.36	575.81	348.23	204.39	60		
63	1	18.0	54.3	133	4650	3700	80	8801	2.38	330.90	37.60	89.43	696.67	283.05	341.65	41		1
70	3	13.0	39.3	158	3440	3170	92	9956	3.14	311.06	31.24	98.13	561.18	320.48	178.26	57		1
73	6	11.0	19.3	53	290	260	90	770	2.96	27.59	35.83	106.12	56.92	24.75	18.60	43		1
77	6	13.0	21.0	54	360	360	100	1205	3.35	42.59	35.34	118.31	72.08	36.86	19.95	54		
78	6	13.0	17.4	18	100	100	100	161	1.61	6.15	38.20	61.50	19.91	5.23	10.20	26		
85	4	16.0	35.7	80	1210	1060	88	3397	3.20	126.62	37.27	119.45	212.02	109.33	79.93	52		1
90	6	27.0	49.2	80	3260	2340	72	8944	3.82	250.37	27.99	107.00	499.07	288.02	181.51	58		1
95	3	17.0	40.2	88	1990	1670	84	5409	3.24	206.10	38.10	123.41	326.43	174.22	125.44	53		1

A LOG LENGTH CHECK IN THE PROGRAM DETERMINES IF THE SUM OF BLOCK LENGTHS IS PLUS OR MINUS 5 PERCENT OF THE LOG LENGTH. IT IS THEREFORE ADVANTAGEOUS FOR THE USER TO WORK WITH ACTUAL LOG LENGTH ON THE CARD TYPE 20 LOG CARD RATHER THAN WITH A ROUNDED OR SCALING MEASUREMENT.

DIAMETER CLASS TABLE FOR LOGS, VR-2

THIS TABLE CONTAINS TOTALS BY 1-INCH DIAMETER CLASSES FOR EACH LOG GRADE. AN ILLUSTRATION IS SHOWN IN FIGURE 8. THE TABLE IS PRODUCED FOR EACH LOG GRADE AND FOR ALL LOG GRADES COMBINED. HEADINGS ARE SIMILAR TO THE DIAMETER CLASS TABLE, VR-1, ALTHOUGH THEY CHANGE IF THE PROGRAM USER IS COMBINING BLOCKS INTO TREES.

PERCENT VENEER RECOVERY TABLE FOR LOGS, VR-2

THIS TABLE CONTAINS THE PERCENT RECOVERY BY 1-INCH DIAMETER CLASSES FOR EACH LOG GRADE. AN ILLUSTRATION IS SHOWN IN FIGURE 9. THE TABLE IS PRODUCED FOR EACH LOG GRADE AND FOR ALL LOG GRADES COMBINED. PERCENTAGE RECOVERIES ARE CALCULATED ONLY IN VR-2, NOT IN VR-1. TABLE HEADINGS CHANGE IF THE USER IS COMBINING BLOCKS INTO TREES. PERCENTAGES ARE COMPUTED TO THE NEAREST ONE-TENTH INCH.

VENEER GRADE AND ITEM TABLE, VR-2

THIS TABLE, AS SHOWN IN FIGURE 10, IS PRODUCED BY PROGRAM PCTITM (PERCENT ITEM). PCTITM IS A SEPARATE PROGRAM BUT IS USED AS A CONSTANT AND INTEGRAL PART OF VR-2. THE PROGRAM PCTITM USES TAPE OUTPUT FROM VR-2 TO PRODUCE THE TABLE FOR PERCENT RECOVERY BY GRADE AND VENEER ITEM ON 3/8-INCH, SQUARE-FOOT BASIS FOR EACH GRADE. A SEPARATE TABLE IS PRODUCED FOR EACH LOG GRADE AND FOR ALL LOG GRADES. REJECT VENEER IS NOT INCLUDED IN THE PERCENTAGE CALCULATIONS OR IN THE TOTAL VOLUME. PERCENTAGES ARE TO THE NEAREST WHOLE PERCENT.

CARD TYPE 13

CARD TYPE 13, PRODUCED AS VR-2 CARD OUTPUT WITH THE SAME FORMAT AS THE VR-1 CARD TYPE 13, IS SIMILAR IN FORMAT TO ENABLE VR-2 OUTPUT TO BE USED AS VR-2 INPUT.

A VENEER THICKNESS CODE IS PUNCHED INTO VR-2 CARD TYPE 13, COLUMN 79. THE THICKNESS CODE IS NEEDED IF THE PROGRAM USER REPRICES AND FOR SUMMARY BY VENEER THICKNESS WHEN A RUN CONTAINS MORE THAN ONE THICKNESS. THIS CODE NUMBER MUST BE GANG PUNCHED INTO VR-1 CARD TYPE 13 BEFORE IT IS USED AS INPUT TO VR-2. (USE ONLY NUMBERS 0-5--IF 0, PROGRAM ASSUMES 1.)

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TOTALS BY ONE-INCH DIAMETER CLASSES FOR LOG GRADE 6

LOG DIA	NO LOG	SCALE GROSS	SCALE NET	PCT SND	VOLUME LOG -3/8	RECOV RATIO	LOG VALUES TOTAL	LOG VALUES $/MVT	LOG VALUES $/MNLS	VOLUMES IN CUBIC FEET LOG	VENEER	REJECT	CORE	CHIPPABLE
12	5	720	710	99	2218	3.12	71.09	32.05	100.13	163.10	68.91	7.92	51.81	34.46
13	6	1000	970	97	3055	3.15	103.49	33.88	106.69	216.78	94.70	19.62	49.04	53.42
14	8	1340	1310	98	4219	3.22	138.59	32.85	105.79	262.29	130.62	10.80	56.77	64.10
15	6	1500	1410	94	4513	3.20	146.97	32.57	104.23	284.09	139.73	23.01	51.69	69.66
16	7	1630	1570	96	4378	2.79	152.75	34.89	97.29	271.93	135.64	17.22	46.57	72.50
17	7	2330	2330	100	7741	3.32	272.91	35.26	117.13	439.84	239.52	31.12	61.97	107.23
18	1	350	350	100	1191	3.40	39.32	33.01	112.34	54.31	36.85	1.67	7.68	8.11
19	1	390	390	100	1024	2.63	46.36	45.27	118.87	54.37	31.74	0.45	7.74	14.44
20	1	450	450	100	1556	3.46	74.41	47.82	165.36	66.95	48.18	0.34	7.74	10.69
21	3	1950	1820	93	5983	3.29	200.48	33.51	110.15	321.52	185.13	26.90	32.13	77.36
22	3	2130	2010	94	5744	2.86	192.17	33.46	95.61	353.50	177.71	59.30	32.95	83.54
23	2	1600	1510	94	4275	2.83	138.35	32.36	91.62	236.54	132.23	31.20	20.65	52.46
24														
25	6	5420	4520	83	12646	2.80	454.16	35.91	100.48	808.11	391.76	130.89	57.23	228.23
26	2	2120	2060	97	5060	2.46	189.92	37.53	92.19	318.02	156.70	63.51	20.57	77.24
27	2	2320	2160	93	6870	3.18	295.80	43.06	136.94	357.27	212.51	39.13	20.71	84.92
28	3	3720	3580	96	9246	2.58	327.13	35.38	91.38	523.53	286.01	67.34	30.94	139.24
29	1	990	380	38	671	1.77	26.61	39.66	70.03	145.66	20.73	13.15	20.05	91.73
30	1	1400	1160	83	4549	3.92	182.25	40.06	157.11	205.84	140.84	15.36	10.27	39.37
31	2	2660	2190	82	5254	2.40	213.95	40.72	97.69	365.31	162.68	77.04	26.98	98.61
32	2	3120	3020	97	7666	2.54	310.35	40.48	102.76	444.98	237.38	92.68	20.68	94.24
33	1	1710	1380	81	4860	3.52	209.57	43.12	151.86	254.83	150.36	7.93	10.36	86.18
34	1	1700	1470	86	1913	1.30	75.02	39.22	51.03	256.60	59.18	51.21	12.43	133.78
35	2	3720	3530	95	11062	3.13	541.32	48.94	153.35	522.01	342.52	19.87	21.38	138.24
36														
37	1	2180	1930	89	5801	3.01	254.16	43.81	131.69	311.01	179.44	40.89	10.29	80.39
38														
39	1	2380	1500	63	7058	4.71	252.87	35.83	168.58	347.71	218.29	24.70	10.26	94.46
40	1	2560	2380	93	4689	1.97	193.36	41.24	81.24	332.72	145.25	90.56	10.22	86.69
TOTAL	76	51390	46090	90	133242	2.89	5103.36	38.30	110.73	7918.82	4124.61	963.81	709.11	2121.29

END OF LOG GRADE 6

FIGURE 8.--DIAMETER CLASS TABLE AS PRODUCED BY VR-2 FOR LOGS.

FIGURE 9.--PERCENT VENEER RECOVERY TABLE AS PRODUCED BY VR-2 FOR LOGS.

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PERCENT RECOVERY BY ONE-INCH DIAMETER CLASSES FOR LOG GRADE 6

LOG DIA	NO LOG	LOG VOL-3/8	$/MVT	PERCENT VENEER RECOVERY A	AP	8	8P	C	D	E	TOTAL
12	5	2218	32.05	0.2	0.9	0.	2.4	27.1	69.4	C.	100.0
13	6	3055	33.88	0.4	1.3	C.	2.0	43.8	52.5	C.	100.0
14	8	4219	32.85	0.3	2.2	0.	1.1	33.6	62.8	C.	100.0
15	6	4513	32.57	0.1	1.2	0.8	4.6	26.9	66.4	C.	100.0
16	7	4378	34.89	0.2	5.1	0.5	6.9	29.4	57.9	0.	100.0
17	7	7741	35.26	0.4	5.4	0.9	9.6	25.1	58.6	C.	100.0
18	1	1191	33.01	C.	0.2	0.3	6.8	31.8	60.9	C.	100.0
19	1	1024	45.27	2.4	25.4	0.	11.4	32.8	28.0	C.	100.0
20	1	1556	47.82	0.4	26.5	1.3	17.5	45.0	9.3	C.	100.0
21	3	5983	33.51	0.2	1.6	0.1	2.9	38.5	56.7	C.	100.0
22	3	5744	33.46	2.2	6.3	0.7	4.4	10.4	76.0	C.	100.0
23	2	4275	32.36	0.4	4.5	0.1	5.1	12.0	77.9	0.	100.0
24											
25	6	12646	35.91	0.5	8.4	0.3	11.8	15.4	63.6	C.	100.0
26	2	5060	37.53	0.1	7.9	0.8	16.8	22.9	51.5	C.	100.0
27	2	6870	43.06	3.4	21.5	2.5	14.5	14.9	43.2	C.	100.0
28	3	9246	35.38	1.1	9.1	0.1	9.2	12.1	68.4	C.	100.0
29	1	671	39.66	0.	18.8	0.	12.4	12.8	56.0	C.	100.0
30	1	4549	40.06	1.1	16.4	1.1	18.7	7.1	55.6	C.	100.0
31	2	5254	40.72	0.3	12.7	0.3	29.0	10.0	47.7	C.	100.0
32	2	7666	40.48	1.4	18.1	1.2	17.2	6.4	55.7	C.	100.0
33	1	4860	43.12	4.5	22.9	0.2	15.0	9.0	48.4	C.	100.0
34	1	1913	39.22	4.2	16.6	0.6	6.6	13.6	58.4	C.	100.0
35	2	11062	48.94	5.8	32.4	1.1	20.3	10.7	29.7	C.	100.0
36											
37	1	5801	43.81	4.3	22.3	3.0	13.5	17.5	39.4	C.	100.0
38											
39	1	7058	35.83	1.2	8.8	4.8	7.7	24.0	49.4	4.1	100.0
40	1	4689	41.24	3.0	20.0	0.9	13.7	8.2	54.2	C.	100.0
TOTAL	76	133242	38.30	1.7	12.6	1.0	11.7	18.2	54.6	0.2	100.0

END OF LOG GRADE 6

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PERCENT RECOVERY BY GRADE AND VENEER ITEM ON 3/8-INCH SQ. FT. BASIS FOR ALL GRADES

THICKNESS .100

VENEER ITEM	GRADE A PCT	GRADE A VOL-3/8	GRADE AP PCT	GRADE AP VOL-3/8	GRADE B PCT	GRADE B VOL-3/8	GRADE BP PCT	GRADE BP VOL-3/8	GRADE C PCT	GRADE C VOL-3/8	GRADE D PCT	GRADE D VOL-3/8	GRADE E PCT	GRADE E VOL-3/8	TOTAL PCT	TOTAL VOL-3/8	REJECT VOL-3/8
FULL SHEETS																	
8 FEET	6	4940	21	17093	2	1429	22	17838	10	7937	39	32375			100	81612	1501
4 FEET																	
7 FEET																	
6 FEET																	
3 FEET																	
SUBTOTAL	6	4940	21	17093	2	1429	22	17838	10	7937	39	32375			100	81612	1501
HALF SHEETS																	
8 FEET	3	3336	15	14405	2	2157	7	7217	19	18390	54	52434		288	100	98227	26462
4 FEET																	
7 FEET																	
6 FEET																	
3 FEET																	
SUBTOTAL	3	3336	15	14405	2	2157	7	7217	19	18390	54	52434		288	100	98227	26462
RANDOM WIDTHS																	
8 FEET	1	330	20	8298	2	692	10	3922	17	6774	50	21026			100	41042	14038
4 FEET									70	6284	30	2685			100	8969	2115
7 FEET	13	111	31	256	6	52	24	197	14	117	12	101			100	834	14
6 FEET	23	413	23	422	7	121	16	284	17	315	14	262		8	100	1825	74
3 FEET			1	6				2	72	334	26	117	1	6	100	465	28
SUBTOTAL	2	854	17	8982	2	865	8	4405	26	13824	45	24191		14	100	53135	16269
TOTAL	4	9130	17	40480	2	4451	13	29460	17	40151	47	109000		302	100	232974	44232

FIGURE 10.--VENEER GRADE AND ITEM TABLE AS PRODUCED BY VR-2 FOR LOGS.

CARD FORMAT IS THE SAME FOR LOGS AND TREES.

OUTPUT CARD TYPES 17 AND 18 REPLACE CARD TYPES 14 AND 15 WHEN BLOCKS OR LOGS ARE COMBINED INTO TREES.

CARD TYPE 14

CARD TYPE 14 IS PRODUCED BY VR-2. IT DIFFERS FROM VR-1 CARD TYPE 14 BY HAVING LOG GRADE IN COLUMNS 65-66 AND LOG GRADE AND SCALING SYSTEM CODE IN COLUMNS 67-68.

CARD TYPE 15

CARD TYPE 15 FOR VR-2 IS PRODUCED IN A FORM NEARLY SIMILAR TO VR-1 CARD TYPE 15. THE DIFFERENCES ARE THAT THE VR-2 CARD CONTAINS LOG GRADE IN COLUMN 66, LOG SCALING AND GRADING SYSTEM IN COLUMNS 67-68, AND ACCUMULATED BLOCK LENGTH IN FEET IN COLUMNS 69-71. THE USER MUST PUNCH IN COLUMN 80 A CODE NUMBER TO INDICATE TO THE PROGRAM WHICH PEELER CORE DIAMETER TO USE FOR CUBIC VOLUME CALCULATIONS IN THE EVENT A BLOCK RECOVERY CONTAINS TWO THICKNESSES OF VENEER. (CORE CODE MAY BE 0, 1, 2, OR 3--IF 0, THE PROGRAM ASSUMES 1.) THE CORE WITH THE HIGHEST CODE NUMBER WILL BE USED IN CALCULATING PEELED CORE VOLUME.

CARD TYPE 16

THE INFORMATION IN THE PERCENT VENEER RECOVERY TABLE FOR LOGS IS PUNCHED IN CARD TYPE 16. A CARD IS PRODUCED FOR EACH 1-INCH DIAMETER CLASS IN A LOG GRADE AND FOR THE LOG GRADE TOTAL. THE 100-PERCENT COLUMN IS NOT PUNCHED.

THE CARD FORMAT IS AS FOLLOWS--

COLUMN NO.	INFORMATION
1- 2	CARD TYPE
3- 4	PROJECT OR RUN IDENTIFICATION NUMBER
5	PRODUCT CONDITION, GREEN, DRY, ETC.
6- 7	GRADING/SCALING SYSTEM CODE
8- 9	BLOCK, LOG, OR TREE GRADE
10-11	DIAMETER CLASS
12-16	NUMBER OF BLOCKS, LOGS, OR TREES IN DIAMETER CLASS
17-23	VENEER VOLUME ON 3/8-INCH SQUARE-FOOT BASIS FOR THE DIAMETER CLASS
24-31	VALUE/M SQUARE FEET OF VENEER ON A 3/8-INCH BASIS FOR THE DIAMETER CLASS
32-59	PERCENTAGE RECOVERY FOR EACH VENEER OF SEVEN POSSIBLE VENEER GRADES
60-80	BLANK

CARD TYPE 'POLY'
==========

VR-2 PRODUCES 'POLY' CARDS FOR A POLYNOMIAL REGRESSION PROGRAM USED BY THE PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION.

A POLY CARD IS PUNCHED FOR EACH OBSERVATION (BLOCK, LOG, OR TREE) IN THE OUTPUT AND FOR EACH GROUP (DIAMETER CLASS) IN A LOG GRADE. CARDS ARE NOT PUNCHED FOR TOTALS OF A LOG GRADE TABLE. THE CARDS FOR THE COMBINED LOGS ARE GRADE CODED WITH NUMBER 1. DECIMAL POINTS ARE NOT PUNCHED. PERCENTAGES ARE ROUNDED TO WHOLE NUMBERS. WHEN BLOCKS OR LOGS ARE COMBINED INTO TREES, LOG DIAMETER IS REPLACED BY TREE DBH, COLUMNS 38-39.

THE CARD FOR EACH OBSERVATION CONTAINS THE FOLLOWING--

COLUMN NO.	INFORMATION
1- 5	CARD NUMBER 00000
6- 7	PROJECT OR RUN IDENTIFICATION NUMBER
8	PRODUCT CONDITION
9-10	GRADING AND SCALING SYSTEM
11-15	VALUE/M SQUARE FEET VENEER TALLY
16-20	VALUE/M BOARD FEET NET SCALE
21-25	RECOVERY RATIO
26-28	PERCENT DEFECT (100-PERCENT SOUNDNESS)
29-35	TOTAL LOG VALUE
36-37	LOG GRADE
38-39	LOG DIAMETER (OR TREE DBH)
40-43	LOG OR TREE NUMBER
44-78	BLANK
79	WEIGHTING FACTOR OF 1
80	FREQUENCY FACTOR OF 1

THE CARD FOR A GROUP (DIAMETER CLASS) IN A LOG GRADE WOULD DIFFER IN THE FOLLOWING COLUMNS--

COLUMN NO.	INFORMATION
40-43	NUMBER OF OBSERVATIONS (LOGS) IN GROUP OR DIAMETER CLASS

CARD TYPE 17

COLUMN NO.	INFORMATION
1- 2	CARD TYPE 17
3- 4	PROJECT OR RUN IDENTIFICATION NUMBER
5	PRODUCT TYPE CODE
6- 7	SPECIES CODE
8-11	TREE NUMBER
12	BLANK
13-16	TREE DBH
17-20	TOP UTILIZED DIAMETER
21-24	TREE LENGTH (UTILIZED OR TOTAL)
25-28	GROSS TREE SCALE
29-32	NET TREE SCALE
33-35	PERCENT SOUND
36-40	TREE VENEER VOLUME SQUARE FEET 3/8-INCH BASIS
41-46	RECOVERY RATIO
47-53	TOTAL TREE VALUE
54-59	VALUE/M SQUARE FEET VENEER TALLY 3/8-INCH BASIS
60-65	VALUE/M BOARD FEET NET TREE SCALE IN COLS. 29-32
66-67	TREE GRADE
68-69	GRADING-SCALING SYSTEM
70-74	TOTAL TREE NET SCALE ACCUMULATED BY LOGS
75-79	TOTAL TREE GROSS SCALE ACCUMULATED BY LOGS
80	BLANK

CARD TYPE 18

COLUMN NO.	INFORMATION
1- 2	CARD TYPE 18
3- 4	PROJECT OR RUN IDENTIFICATION NUMBER
5	PRODUCT TYPE CODE
6- 7	SPECIES CODE
8-11	TREE NUMBER
12	BLANK
13-16	TREE DBH
17-20	TOP UTILIZED DIAMETER
21-23	TREE LENGTH (UTILIZED OR TOTAL)
24-27	PERCENT SOUND
28-34	TREE CUBIC VOLUME UTILIZED
35-41	TREE VENEER CUBIC VOLUME
42-48	REJECT VENEER CUBIC VOLUME

49-55	TOTAL CORE CUBIC VOLUME
56-62	TOTAL CHIPPABLE CUBIC VOLUME
63-65	TREE RECOVERY RATIO
66-72	TREE SURFACE AREA
73	TREE GRADE
74-75	GRADING-SCALING SYSTEM
76-78	TREE LENGTH ACCUMULATED
79-80	BLANK

PROGRAM CHECKS

THE NUMBERS IN THE CHECKS CODE COLUMN OF THE BLOCK OR LOG SUMMARY TABLE IDENTIFY THESE CONDITIONS--

1. THE TOTAL BLOCK LENGTHS ARE PLUS OR MINUS 5 PERCENT OF THE LOG LENGTH.

2. THE PERCENT RECOVERY IS OUTSIDE THE LIMITS THE USER SETS ON THE CONTROL CARD.

THE PROGRAM OUTPUT WILL NOT CONTINUE WHEN THE FOLLOWING STATEMENTS ARE PRINTED AS A RESULT OF ERRORS ENCOUNTERED--

1. SEQUENCE ERROR--NO CONTROL CARD

2. PROJECT XX HAS PROJECT XX PRICE CARD

3. SEQUENCE ERROR--THE FIRST CARD NOT A LOG CARD

4. TREE NUMBERS NOT ASCENDING

5. MIXED LOG NUMBERS

6. MIXED BLOCK NUMBERS

THE FOLLOWING ARE ERROR STATEMENTS THAT ARE PRINTED BUT DO NOT CAUSE THE PROGRAM TO STOP--

1. CT13 AND CT14 MISSING AFTER CT20

2. CT14 NOT FOLLOWED BY CT15

3. NUMBER OF CT14 NOT EQUAL TO NUMBER OF CT15

4. CT13 AND CT14 MISSING FOR A BLOCK

OPERATING TIME

VR-2 REQUIRES ABOUT 3 TO 4 MINUTES TO PROCESS A VR-1 INPUT DECK OF ABOUT 2,000 CARDS.

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